STORMWATER MANAGEMENT REPORT

PROPOSED

BRISTOL SOLAR ONE, LLC

SOLAR PROJECT

399 HILL STREET
BRISTOL, CONNECTICUT
HARTFORD COUNTY

Prepared for:

Bristol Solar One, LLC
150 Trumbull Street, 4th Floor
Hartford, CT

Prepared by:

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May 2020

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Introduction

At the request of Bristol Solar One, LLC, All-Points Technology Corporation, P.C. ("APT") has undertaken analysis of and design to address stormwater impacts resulting from development of a proposed 3.25 MW direct current (DC) solar electric generating facility in North Canaan, Connecticut (the "Project"). The Project, known as the Bristol Solar One, LLC project, involves the installation of solar panels and associated equipment at 399 Hill Street in Bristol, Connecticut ("Site").

The purpose of this report is to provide an analysis of the potential stormwater drainage impacts associated with the Project, as well as a description of the design to mitigate such potential stormwater drainage impacts. The design is intended to be in full compliance with the State and Town regulations while taking prevailing site conditions and practical factors into account.

Existing Site Conditions

The Site is a privately-owned irregular shaped parcel located at 399 Hill Street in Bristol, Connecticut, that consists of approximately 26.90± acres of undeveloped land. The property has an existing gravel drive off of Sand Road and is partially cleared.

The Site's existing topography generally slopes downward from west to east. Within the project area, the topography includes slopes that range from approximately 0 to 35 percent throughout. Elevations within the Site range from approximately 809 feet AMSL near the middle portion of the site to approximately 673 feet AMSL along the western side and 726 feet AMSL at the southeastern corner.

Developed Site Conditions

The Project will be constructed in the western area of the Site, just west of an existing stream and wetland system. Access to the Site will be provided via a proposed gravel access road extension on the existing Minor Street gravel road, near the northeastern corner. The Project includes the installation of 11,492 solar panels (9,620 Trina TSM-DE15MC.20(II) 390W modules and 1,872 Risen RSM144-6-380BMDG 380W modules) and associated fencing, access road, utility and stormwater management features, within 18.90± acres of the Site. Of the 18.90± acres, 0.68± acre within existing woods will require clearing and grubbing for the Project. The remaining 18.22± acres within the Project limits of disturbance is in existing brush/fields and will require minimal clearing.

The proposed solar panels will be installed on a post driven ground mounted racking system, with minimal changes to the existing grades. As a result, the post-development site conditions will mimic the pre-developed site conditions. Areas of clearing and grubbing and any existing ground cover that is disturbed during construction will be reseeded with a low growth seed mix. In order to account for the change in ground cover and time of concentration, grass-lined stormwater management basins are proposed along the western, eastern, and southern sides of the proposed Project area.

Stormwater Management

Analysis Methodology

The hydrologic analysis was performed using the HydroCAD stormwater modeling system computer program developed by HydroCAD Software Solutions, LLC.

Hydrographs for each watershed were developed using the SCS Synthetic Unit Hydrograph Method with a Type III rainfall distribution. Hydrographs were developed for the NOAA Atlas 14, Volume 10, Version 2 Precipitation 2-, 25-, 50-, and 100-year storm event with rainfall depths of 3.61, 7.13, 8.12, and 9.21 inches respectively.

The existing and proposed drainage areas used in the calculations are illustrated on the Existing and Proposed Drainage Area Plans (EDA-1 & PDA-1). These maps and the corresponding HydroCAD output are attached.

Utilizing Appendix I, Stormwater Management at Solar Array Construction Projects, provided by Connecticut Department of Energy & Environmental Projection ("CT DEEP"), this hydrologic analysis will reflect a reduction of the Hydrologic Soil Group ("HSG") present on-site by one (1) step (e.g. soils of HSG B shall be considered HSG C). This reduction, as indicated by CT DEEP, is intended to account for the compaction of soils that results from extensive machinery traffic during construction of the array. The Water Quality Volume ("WQV") for the site will be calculated assuming that the solar panels, roadways, gravel surfaces, and transformer pads are effectively impervious cover. See Appendix F.

Existing Drainage Patterns

The proposed Project area drains from the west to the east, ultimately into Sand Road and an existing pond located east of the property.

The Site was modeled at three (3) Analysis Points ("AP-1", "AP-2", and "AP-3"). AP-1 is along the existing wetlands to the west. AP-2 follows the existing drainage patterns to the wetland located in the southern middle of the Site, which eventually drains offsite to the south. AP-3 follows the drainage of the existing wetland/stream system along the eastern portion of the Site and drains southeast off the property. Peak discharges have been computed at the points of study for the 2-, 25-, 50-, and 100-year storm events.

The project site soils identified by the United States Department of Agriculture (USDA) Natural Resources Conservation Service consist of Map Unit Symbol 4, named "Leicester fine sandy loam", 45B, named "Woodbridge fine sandy loam, 3 to 8 percent slopes", 84B, named Paxton and Montauk fine sandy loams, 3 to 8 percent slopes", 84C, named Paxton and Montauk fine sandy loams, 8 to 15 percent slopes", and 3, named "Ridgebury, Leicester and Whitman soils, 0 to 8 percent slopes, extremely stony". Map Unit Symbol 4 is classified in the HSG rating of "B", 45B, 84B, and 84C are classified in the HSG rating of "C", and 3 is classified in the HSG rating of "D".

The pre-developed discharges at the Analysis Point are tabulated in Table 1-1.

Table 1-1

Analysis Point	**Pre-developed Peak Storm Runoff (Q), cubic feet per second (cfs)**			
	2-year	**25-year**	**50-year**	**100-year**
AP-1	4.27	15.34	18.76	22.59
AP-2	7.63	24.31	29.36	34.92
AP-3	5.31	16.90	20.36	24.20

Proposed Drainage Patterns

The Project will require clearing and grubbing, although minimal, in the immediate area for the proposed solar installation, including the necessary utilities, access road, and stormwater management features, resulting in approximately 18.90± acres of disturbance. Overall, hydrologically, through the addition of catchment areas associated with the individual drainage areas of each proposed basin, the post-developed condition is designed to mimic the pre-developed condition.

To manage the increase in post-development runoff due to the change in cover type associated with converting woods to meadow and the reductions in one full HSG within the proposed limit of disturbance, four (4) grass-lined stormwater management basins are proposed throughout the project area; two (2) located east and just upstream of the wetland to the west, one (1) located northwest and upstream of the wetland to the couth, and one (1) located west of the wetland to the east. Additionally, four (4) grass swales are proposed to facilitate flow to the proposed basins. Using an outlet control structure with a low flow orifice and grate top in each basin, as needed, the basins are designed to provide the necessary water quality treatment volume for the additional impervious area, as recommended by CT DEEP Appendix I. See calculations attached.

The proposed basins bottom elevations along the western side of the project (B-1A and B-1B) are anticipated to be below the groundwater table. Basin B-1A is designed with an outlet culvert with an invert at the bottom of the basin that will allow for any groundwater that seeps into the basin to directly discharge into the plunge pool. Basins B-1B, B-2, and B-3 are designed with an outlet control device that will maintain approximately 1.4 feet, 0.85 feet, and 1.05 feet of standing water, respectively, within the basin from potential groundwater seepage. The basins are designed with an outlet control structure (except for B-1A), rip-rap overflow weir, and plunge pool level spreader.

Since the proposed development mimics the existing conditions, the post-development condition was modeled using the same Analysis Points. Peak discharges have been computed at the point of study for the 2-year, 25-year, 50-year, and 100-year storm events. The post-development discharges at each point of study are tabulated in Table 1-2.

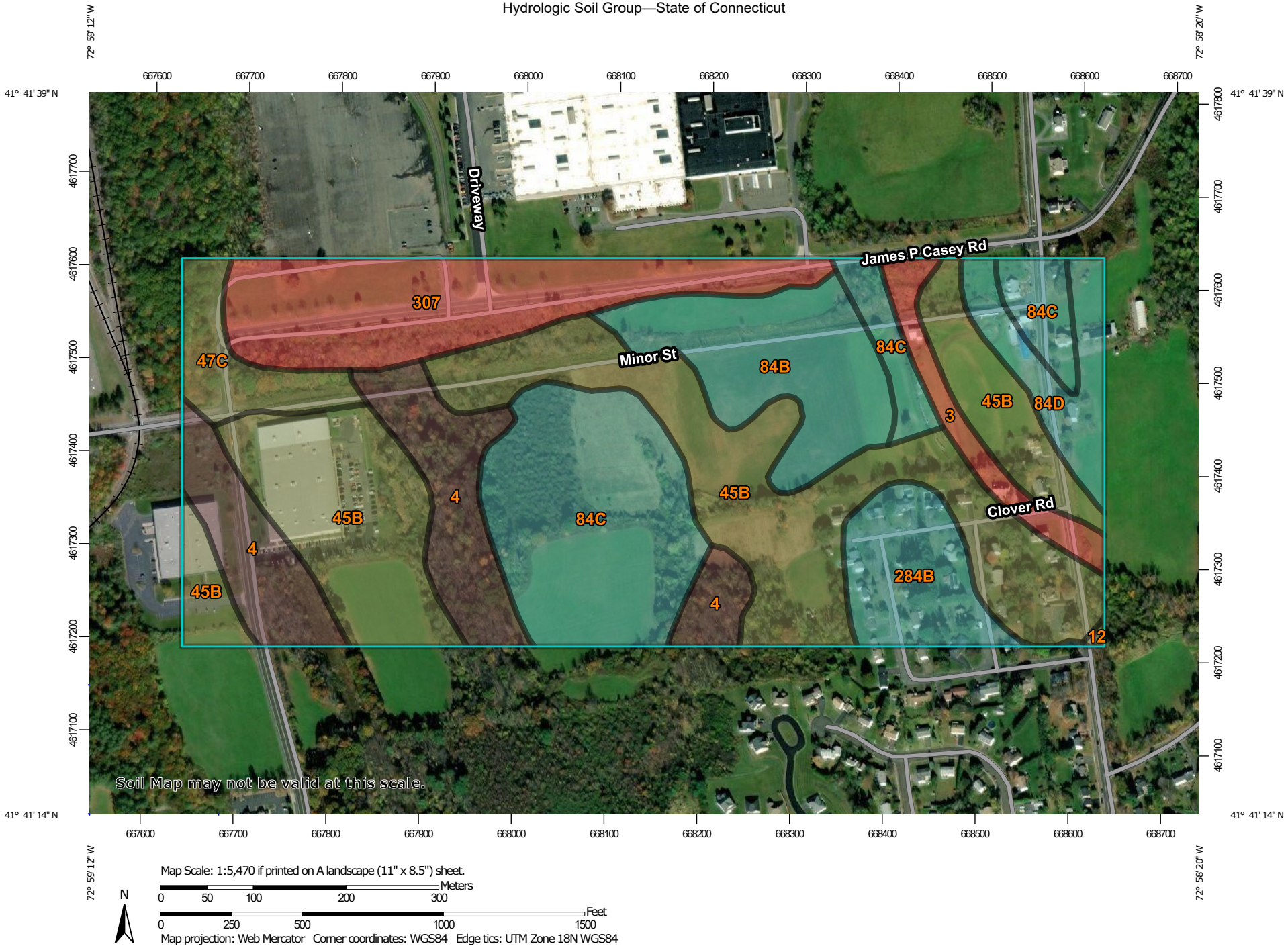
Table 1-2

Analysis Point	**Post-developed Peak Storm Runoff (Q), cubic feet per second (cfs)**			
	2-year	**25-year**	**50-year**	**100-year**
AP-1	4.09	14.12	17.94	22.51
AP-2	2.97	23.80	29.18	34.81
AP-3	3.77	16.38	19.72	23.40

Conclusion

The stormwater management for the proposed site has been designed such that the post-development peak discharges to the waters of the State of Connecticut for the 2-, 25-, 50-, and 100- year storm events are less than the pre-development peak discharges. As a result, the proposed solar array will not result in any adverse conditions to the surrounding areas and properties.

APPENDIX A: NRCS SOIL SURVEY


72° 59' 12" W
72° 58' 20" W
41° 41' 39" N
41° 41' 14" N
667600
667700
667800
667900
668000
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668200
668300
668400
668500
668600
668700
4617800
4617700
4617600
4617500
4617400
4617300
4617200
4617100
Driveway
James P Casey Rd
Minor St
Clover Rd
307
47C
84B
84C
84C
84C
45B
84D
3
45B
4
45B
84C
4
45B
4
284B
12
Soil Map may not be valid at this scale.
Map Scale: 1:5,470 if printed on A landscape (11" x 8.5") sheet.
N
Meters
0 50 100 200 300
Feet
0 250 500 1000 1500
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 18N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Rating Polygons

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Lines

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Soil Rating Points

A

A/D

B

B/D

C

C/D

D

Not rated or not available

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:12,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: State of Connecticut
Survey Area Data: Version 18, Dec 6, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Aug 27, 2016—Oct 30, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
3	Ridgebury, Leicester, and Whitman soils, 0 to 8 percent slopes, extremely stony	D	3.0	2.9%
4	Leicester fine sandy loam	B/D	12.3	11.9%
12	Raypol silt loam	C/D	0.1	0.1%
45B	Woodbridge fine sandy loam, 3 to 8 percent slopes	C/D	34.6	33.6%
47C	Woodbridge fine sandy loam, 3 to 15 percent slopes, extremely stony	C/D	3.7	3.6%
84B	Paxton and Montauk fine sandy loams, 3 to 8 percent slopes	C	9.3	9.1%
84C	Paxton and Montauk fine sandy loams, 8 to 15 percent slopes	C	17.5	17.0%
84D	Paxton and Montauk fine sandy loams, 15 to 25 percent slopes	C	4.2	4.1%
284B	Paxton-Urban land complex, 3 to 8 percent slopes	C	5.7	5.5%
307	Urban land	D	12.5	12.2%
Totals for Area of Interest			**102.9**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

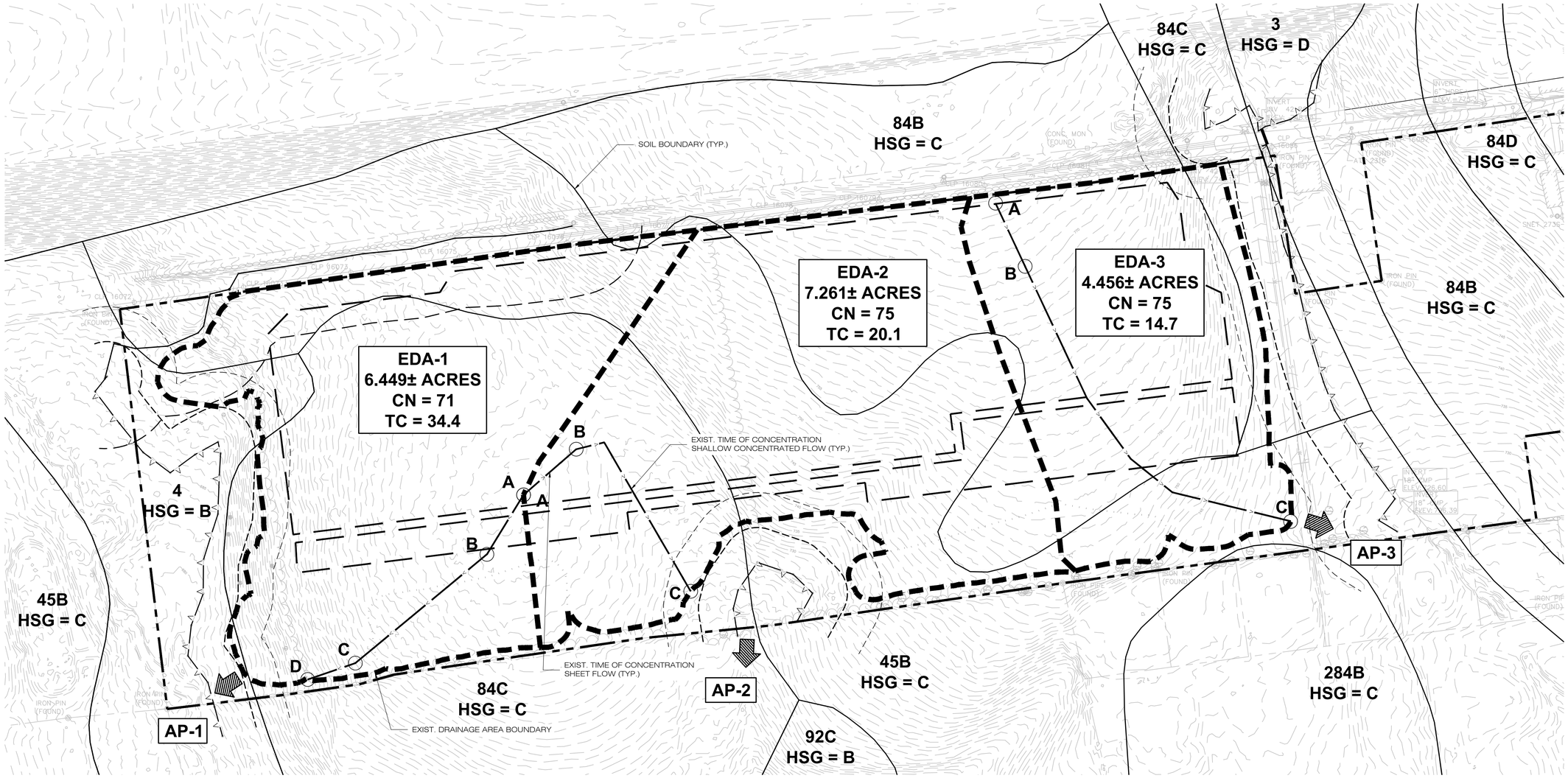
Component Percent Cutoff: None Specified

Tie-break Rule: Higher

APPENDIX B: EXISTING DRAINAGE AREA MAP (EDA-1) & HYDROLOGIC COMPUTATION (HYDROCAD)

EXISTING DRAINAGE AREAS

	TOTAL AREA (ACRES)	COMPOSITE CN	TC (MINS.)
EDA-1	6.449±	71	34.4
EDA-2	7.261±	75	20.1
EDA-3	4.456±	75	14.7



1 EDA-1 **EXISTING DRAINAGE AREA MAP**
SCALE : 1" = 80'-0"

80 0 40 80 160
(IN FEET) 1 inch = 80 ft.

BRISTOL SOLAR ONE, LLC

150 TRUMBULL STREET
4TH FLOOR
HARTFORD, CT, 06103

ALL-POINTS TECHNOLOGY CORPORATION
567 VAUXHAUL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935

PERMIT SET

NO	DATE	REVISION
0	05/20/20	FOR REVIEW: BJP
1		
2		
3		
4		
5		
6		

NOT FOR CONSTRUCTION

DESIGN PROFESSIONAL OF RECORD

PROF: BRADLEY J. PARSONS P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION
ADD: 567 VAUXHAUL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: MARK E., ANN L. & PAUL C. MINOR
ADDRESS: 399 HILL STREET BRISTOL, CT

BRISTOL SOLAR ONE, LLC

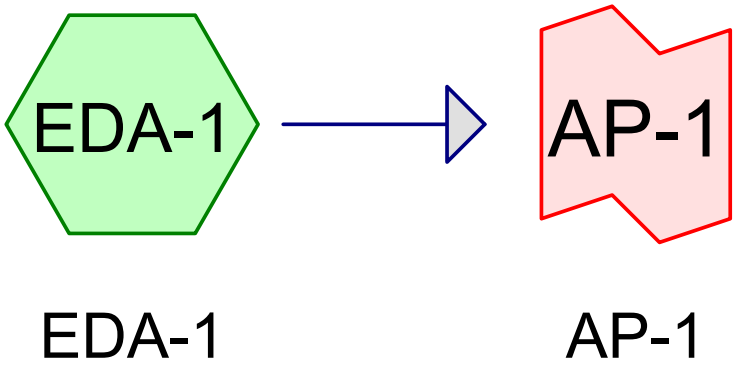
SITE ADDRESS: 399 HILL STREET BRISTOL, CT

APT FILING NUMBER: CT590220

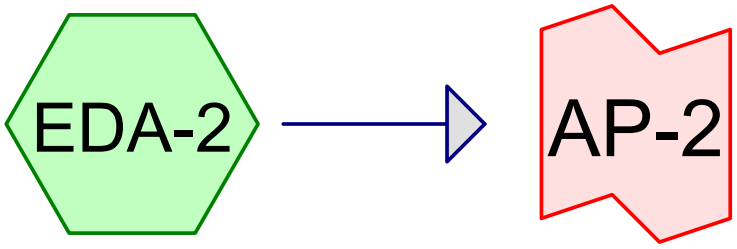
DRAWN BY: JT
DATE: 05/20/20
CHECKED BY: BJP

SHEET TITLE:
EXISTING DRAINAGE AREA MAP

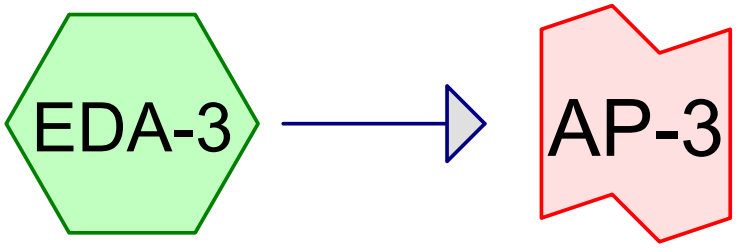
SHEET NUMBER:
EDA-1



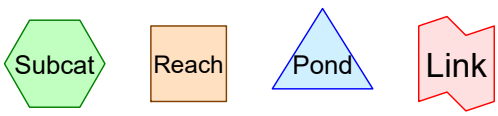
EDA-1 AP-1



EDA-2 AP-2



EDA-3 AP-3



Routing Diagram for CT590220_BristolSolarOne - EX - Rev0
Prepared by Microsoft, Printed 5/20/2020
HydroCAD® 10.00-25 s/n 07402 © 2019 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.166	56	Brush, Fair, HSG B (EDA-1)
6.495	70	Brush, Fair, HSG C (EDA-1, EDA-2)
1.815	77	Brush, Fair, HSG D (EDA-1, EDA-2, EDA-3)
5.841	74	Pasture/grassland/range, Good, HSG C (EDA-2, EDA-3)
3.273	80	Pasture/grassland/range, Good, HSG D (EDA-2, EDA-3)
0.156	55	Woods, Good, HSG B (EDA-1)
0.323	70	Woods, Good, HSG C (EDA-1)
0.097	77	Woods, Good, HSG D (EDA-1)
18.166	**74**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.322	HSG B	EDA-1
12.659	HSG C	EDA-1, EDA-2, EDA-3
5.185	HSG D	EDA-1, EDA-2, EDA-3
0.000	Other	
18.166		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.166	6.495	1.815	0.000	8.476	Brush, Fair	ED A-1, ED A-2, ED A-3
0.000	0.000	5.841	3.273	0.000	9.114	Pasture/grassland/range, Good	ED A-2, ED A-3
0.000	0.156	0.323	0.097	0.000	0.576	Woods, Good	ED A-1
0.000	**0.322**	**12.659**	**5.185**	**0.000**	**18.166**	**TOTAL AREA**	

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EDA-1: EDA-1 Runoff Area=6.449 ac 0.00% Impervious Runoff Depth=1.13"
Flow Length=417' Tc=34.4 min CN=71 Runoff=4.27 cfs 0.610 af

Subcatchment EDA-2: EDA-2 Runoff Area=7.261 ac 0.00% Impervious Runoff Depth=1.38"
Flow Length=388' Tc=20.1 min CN=75 Runoff=7.63 cfs 0.835 af

Subcatchment EDA-3: EDA-3 Runoff Area=4.456 ac 0.00% Impervious Runoff Depth=1.38"
Flow Length=667' Tc=14.7 min CN=75 Runoff=5.31 cfs 0.513 af

Link AP-1: AP-1 Inflow=4.27 cfs 0.610 af
Primary=4.27 cfs 0.610 af

Link AP-2: AP-2 Inflow=7.63 cfs 0.835 af
Primary=7.63 cfs 0.835 af

Link AP-3: AP-3 Inflow=5.31 cfs 0.513 af
Primary=5.31 cfs 0.513 af

Total Runoff Area = 18.166 ac Runoff Volume = 1.957 af Average Runoff Depth = 1.29"
100.00% Pervious = 18.166 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment EDA-1: EDA-1

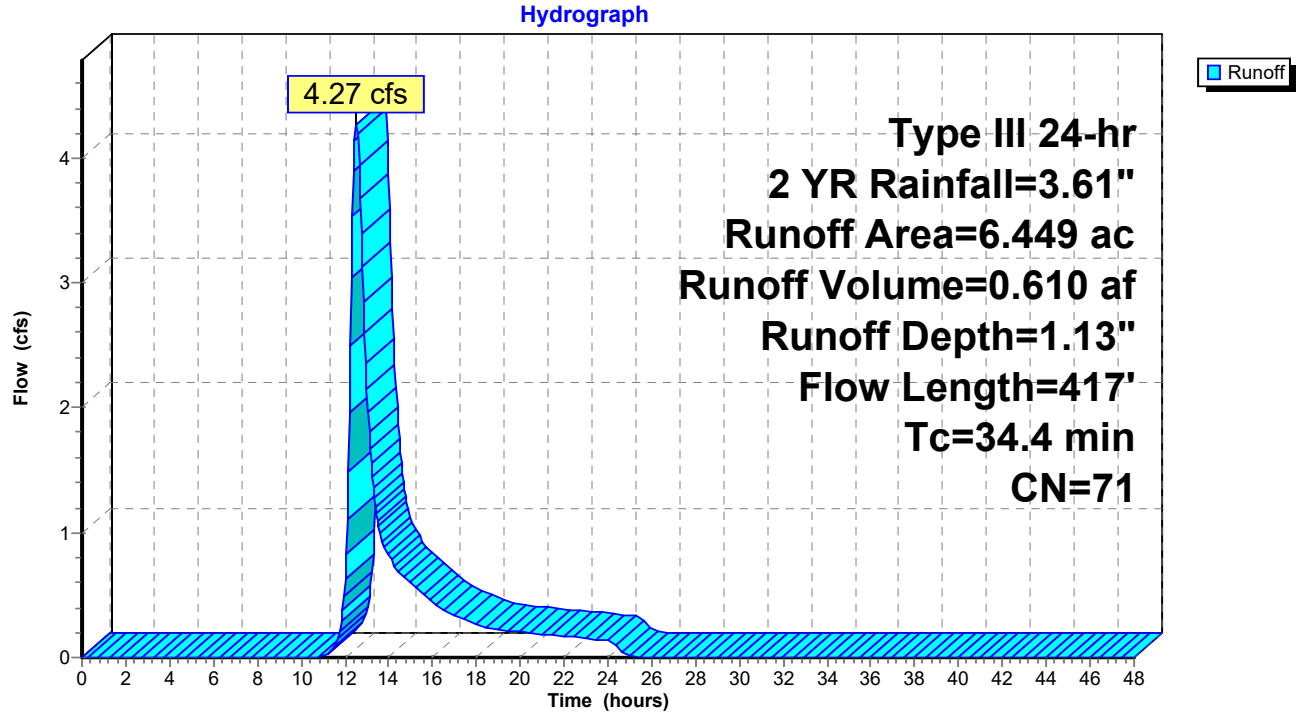
Runoff = 4.27 cfs @ 12.52 hrs, Volume= 0.610 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.61"

Area (ac)	CN	Description
0.156	55	Woods, Good, HSG B
0.166	56	Brush, Fair, HSG B
0.323	70	Woods, Good, HSG C
4.514	70	Brush, Fair, HSG C
0.097	77	Woods, Good, HSG D
1.193	77	Brush, Fair, HSG D
6.449	71	Weighted Average
6.449		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.8	100	0.0070	0.05		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.61"
3.0	245	0.0744	1.36		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.6	72	0.1573	1.98		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
34.4	417	Total			

Subcatchment EDA-1: EDA-1



Summary for Subcatchment EDA-2: EDA-2

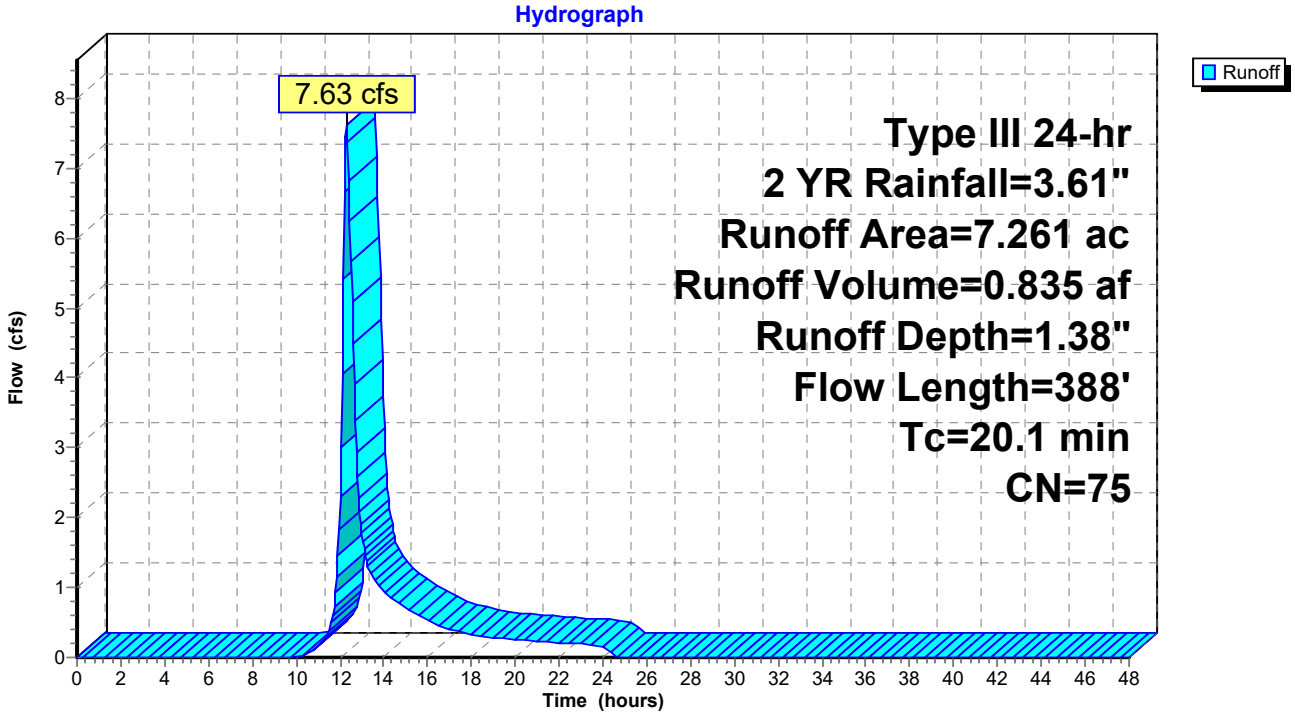
Runoff = 7.63 cfs @ 12.30 hrs, Volume= 0.835 af, Depth= 1.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.61"

Area (ac)	CN	Description
1.981	70	Brush, Fair, HSG C
2.215	74	Pasture/grassland/range, Good, HSG C
0.621	77	Brush, Fair, HSG D
2.444	80	Pasture/grassland/range, Good, HSG D
7.261	75	Weighted Average
7.261		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6	100	0.0118	0.10		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.61"
3.5	288	0.0387	1.38		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
20.1	388	Total			

Subcatchment EDA-2: EDA-2



Summary for Subcatchment EDA-3: EDA-3

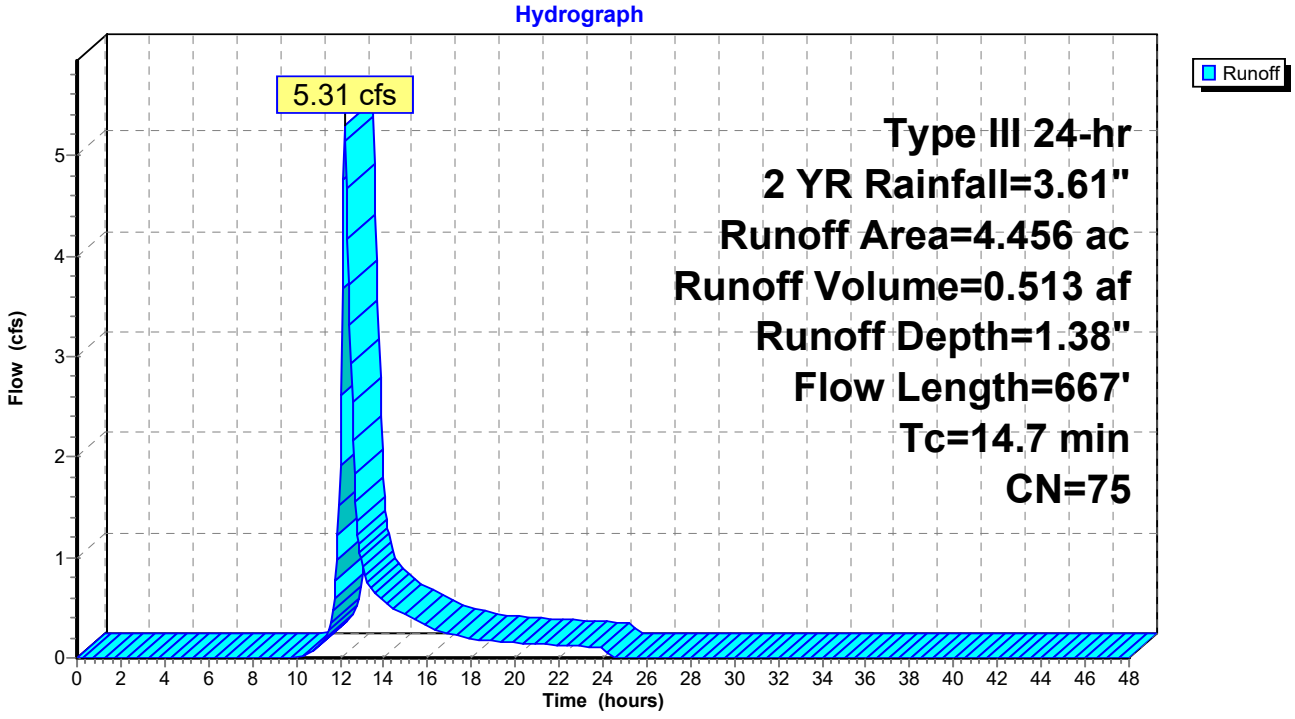
Runoff = 5.31 cfs @ 12.21 hrs, Volume= 0.513 af, Depth= 1.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.61"

Area (ac)	CN	Description
3.626	74	Pasture/grassland/range, Good, HSG C
0.001	77	Brush, Fair, HSG D
0.829	80	Pasture/grassland/range, Good, HSG D
4.456	75	Weighted Average
4.456		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0503	0.18		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.61"
5.4	567	0.0628	1.75		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
14.7	667	Total			

Subcatchment EDA-3: EDA-3

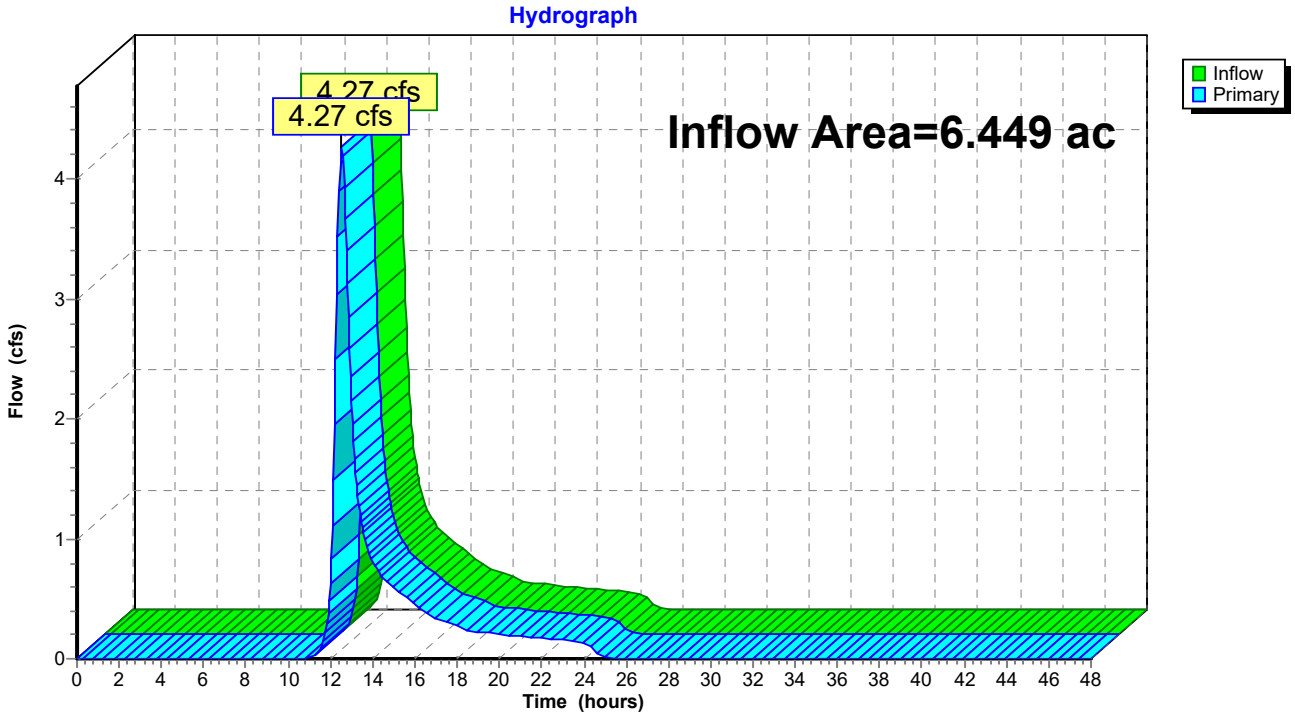


Summary for Link AP-1: AP-1

Inflow Area = 6.449 ac, 0.00% Impervious, Inflow Depth = 1.13" for 2 YR event
Inflow = 4.27 cfs @ 12.52 hrs, Volume= 0.610 af
Primary = 4.27 cfs @ 12.52 hrs, Volume= 0.610 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link AP-1: AP-1

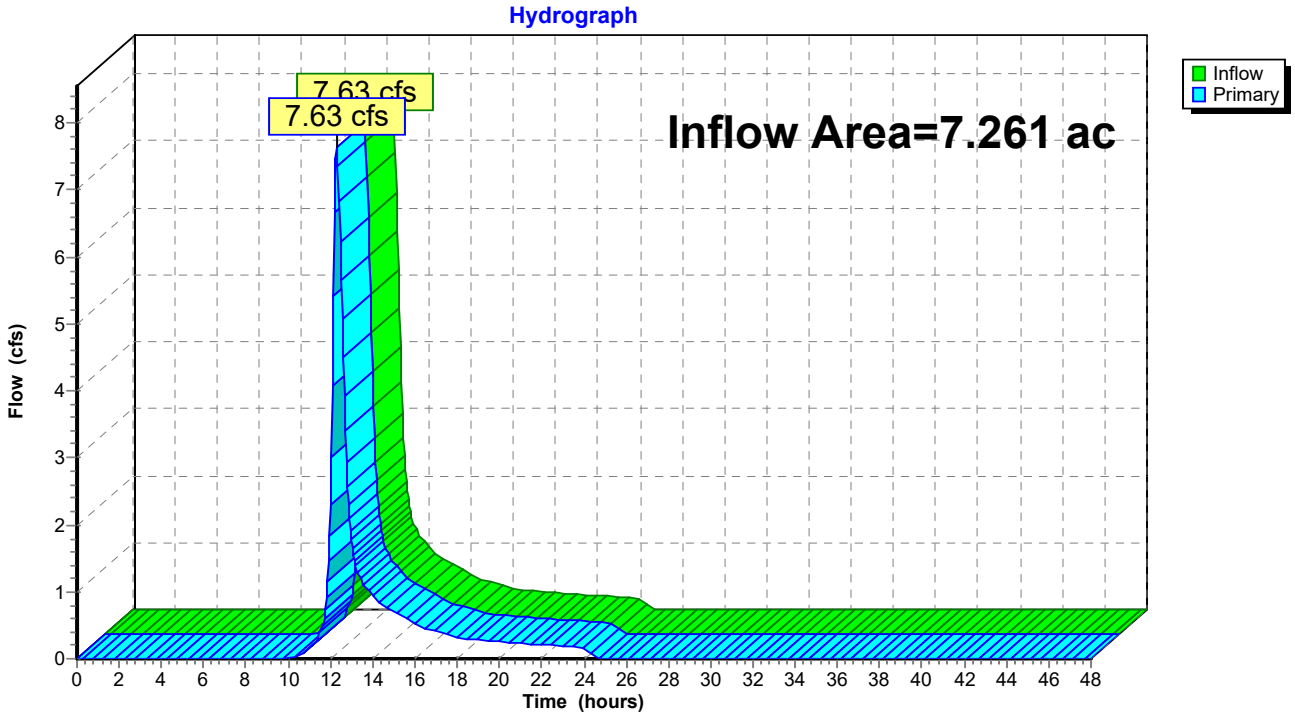


Summary for Link AP-2: AP-2

Inflow Area = 7.261 ac, 0.00% Impervious, Inflow Depth = 1.38" for 2 YR event
Inflow = 7.63 cfs @ 12.30 hrs, Volume= 0.835 af
Primary = 7.63 cfs @ 12.30 hrs, Volume= 0.835 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link AP-2: AP-2

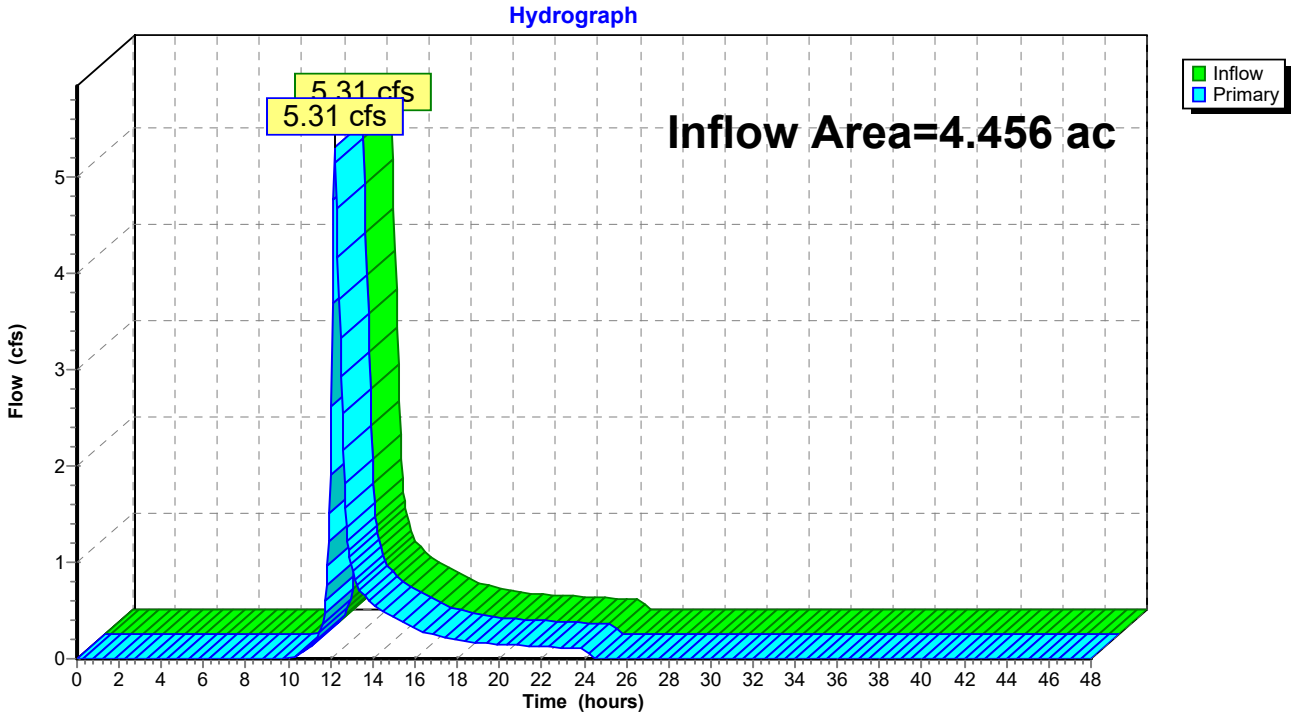


Summary for Link AP-3: AP-3

Inflow Area = 4.456 ac, 0.00% Impervious, Inflow Depth = 1.38" for 2 YR event
Inflow = 5.31 cfs @ 12.21 hrs, Volume= 0.513 af
Primary = 5.31 cfs @ 12.21 hrs, Volume= 0.513 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link AP-3: AP-3



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EDA-1: EDA-1 Runoff Area=6.449 ac 0.00% Impervious Runoff Depth=3.83"
Flow Length=417' Tc=34.4 min CN=71 Runoff=15.34 cfs 2.060 af

Subcatchment EDA-2: EDA-2 Runoff Area=7.261 ac 0.00% Impervious Runoff Depth=4.26"
Flow Length=388' Tc=20.1 min CN=75 Runoff=24.31 cfs 2.580 af

Subcatchment EDA-3: EDA-3 Runoff Area=4.456 ac 0.00% Impervious Runoff Depth=4.26"
Flow Length=667' Tc=14.7 min CN=75 Runoff=16.90 cfs 1.583 af

Link AP-1: AP-1 Inflow=15.34 cfs 2.060 af
Primary=15.34 cfs 2.060 af

Link AP-2: AP-2 Inflow=24.31 cfs 2.580 af
Primary=24.31 cfs 2.580 af

Link AP-3: AP-3 Inflow=16.90 cfs 1.583 af
Primary=16.90 cfs 1.583 af

Total Runoff Area = 18.166 ac Runoff Volume = 6.224 af Average Runoff Depth = 4.11"
100.00% Pervious = 18.166 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment EDA-1: EDA-1

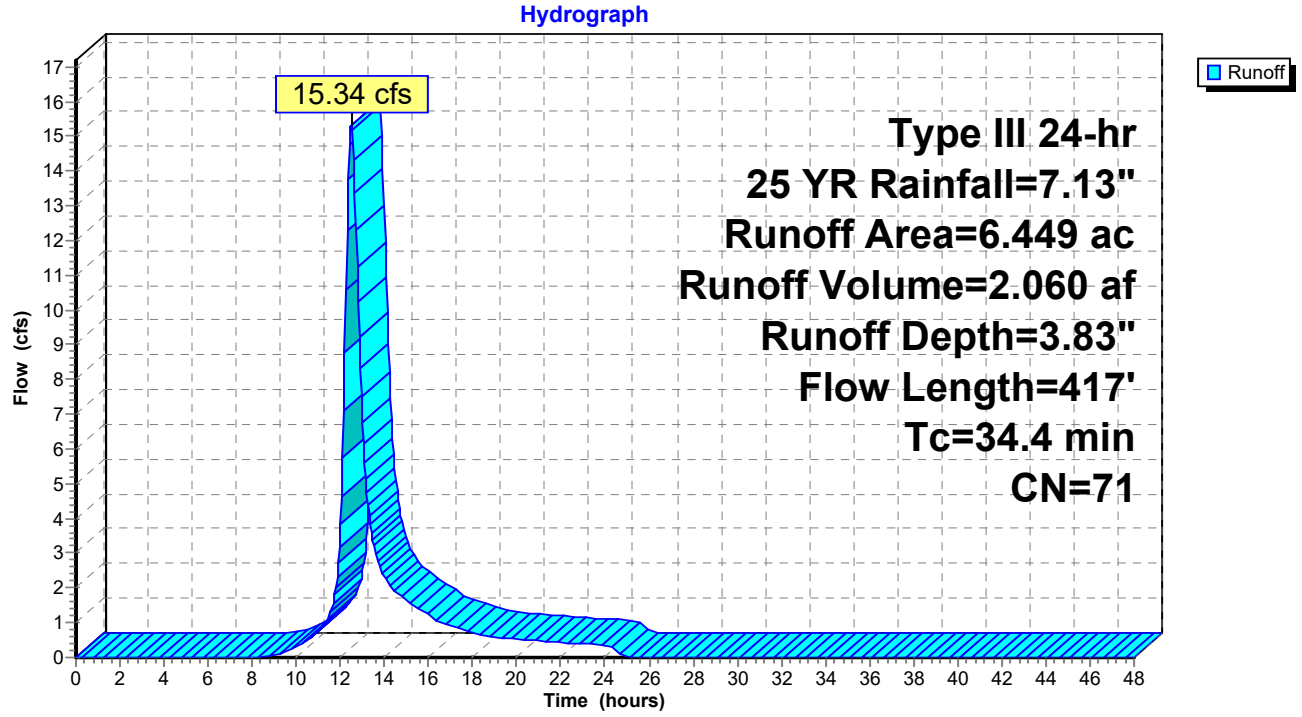
Runoff = 15.34 cfs @ 12.48 hrs, Volume= 2.060 af, Depth= 3.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=7.13"

Area (ac)	CN	Description
0.156	55	Woods, Good, HSG B
0.166	56	Brush, Fair, HSG B
0.323	70	Woods, Good, HSG C
4.514	70	Brush, Fair, HSG C
0.097	77	Woods, Good, HSG D
1.193	77	Brush, Fair, HSG D
6.449	71	Weighted Average
6.449		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.8	100	0.0070	0.05		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.61"
3.0	245	0.0744	1.36		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.6	72	0.1573	1.98		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
34.4	417	Total			

Subcatchment EDA-1: EDA-1



Summary for Subcatchment EDA-2: EDA-2

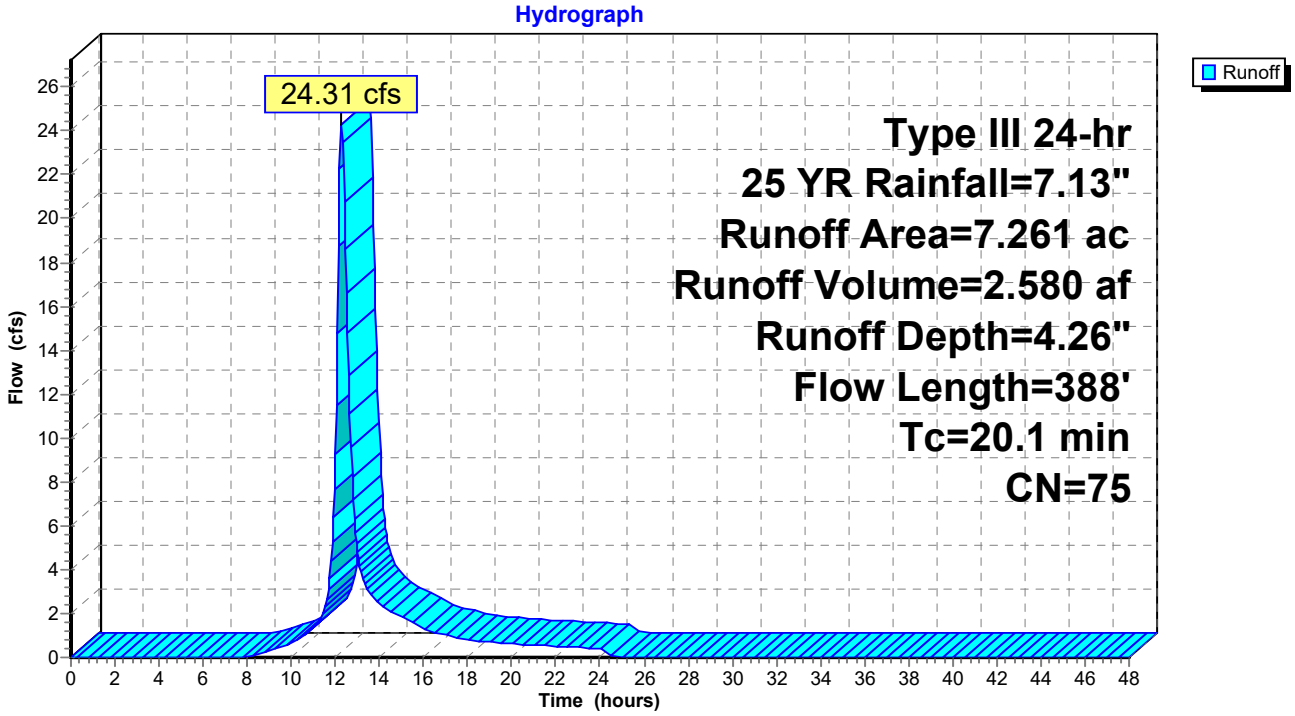
Runoff = 24.31 cfs @ 12.28 hrs, Volume= 2.580 af, Depth= 4.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=7.13"

Area (ac)	CN	Description
1.981	70	Brush, Fair, HSG C
2.215	74	Pasture/grassland/range, Good, HSG C
0.621	77	Brush, Fair, HSG D
2.444	80	Pasture/grassland/range, Good, HSG D
7.261	75	Weighted Average
7.261		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6	100	0.0118	0.10		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.61"
3.5	288	0.0387	1.38		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
20.1	388	Total			

Subcatchment EDA-2: EDA-2



Summary for Subcatchment EDA-3: EDA-3

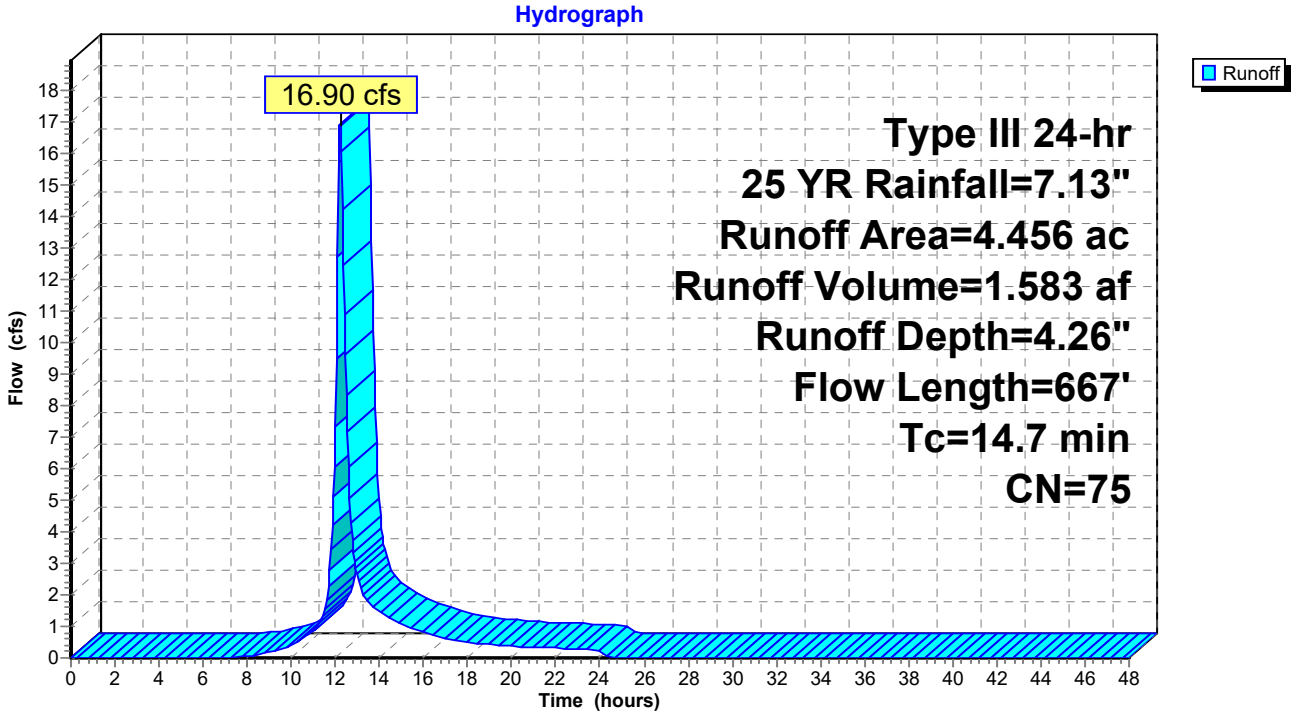
Runoff = 16.90 cfs @ 12.20 hrs, Volume= 1.583 af, Depth= 4.26"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=7.13"

Area (ac)	CN	Description
3.626	74	Pasture/grassland/range, Good, HSG C
0.001	77	Brush, Fair, HSG D
0.829	80	Pasture/grassland/range, Good, HSG D
4.456	75	Weighted Average
4.456		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0503	0.18		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.61"
5.4	567	0.0628	1.75		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
14.7	667	Total			

Subcatchment EDA-3: EDA-3

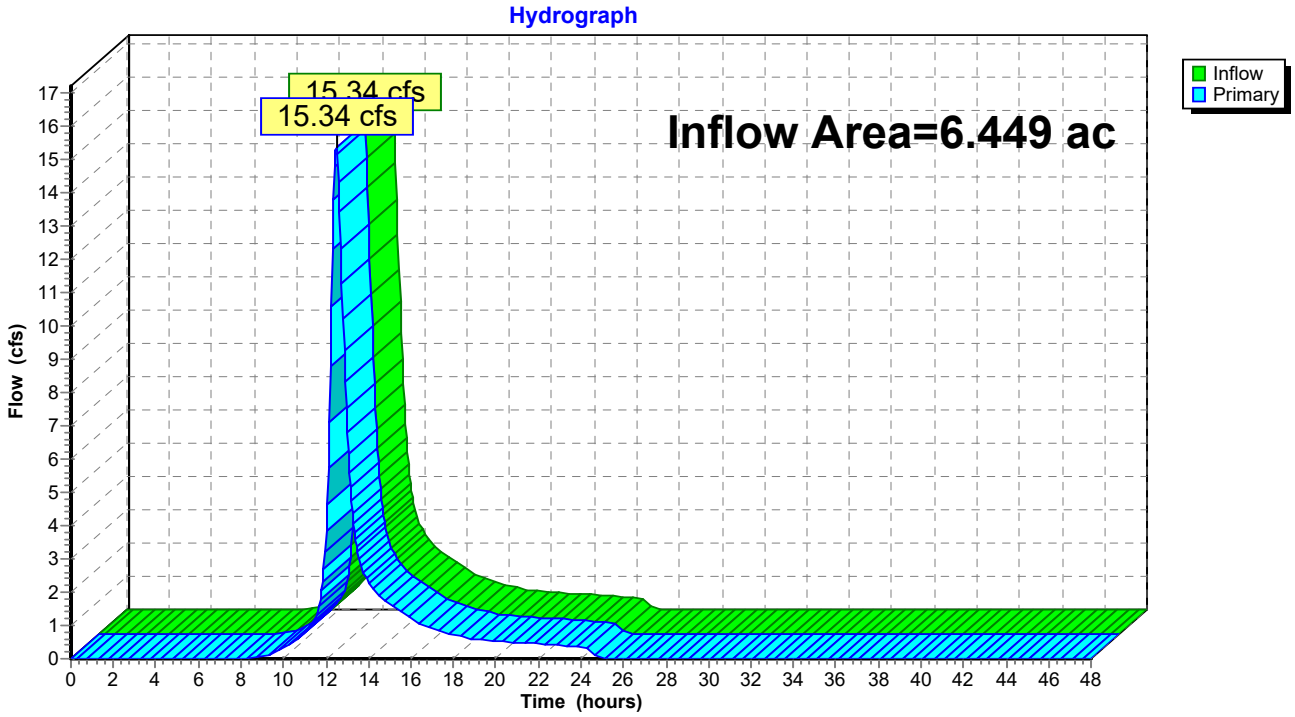


Summary for Link AP-1: AP-1

Inflow Area = 6.449 ac, 0.00% Impervious, Inflow Depth = 3.83" for 25 YR event
Inflow = 15.34 cfs @ 12.48 hrs, Volume= 2.060 af
Primary = 15.34 cfs @ 12.48 hrs, Volume= 2.060 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link AP-1: AP-1

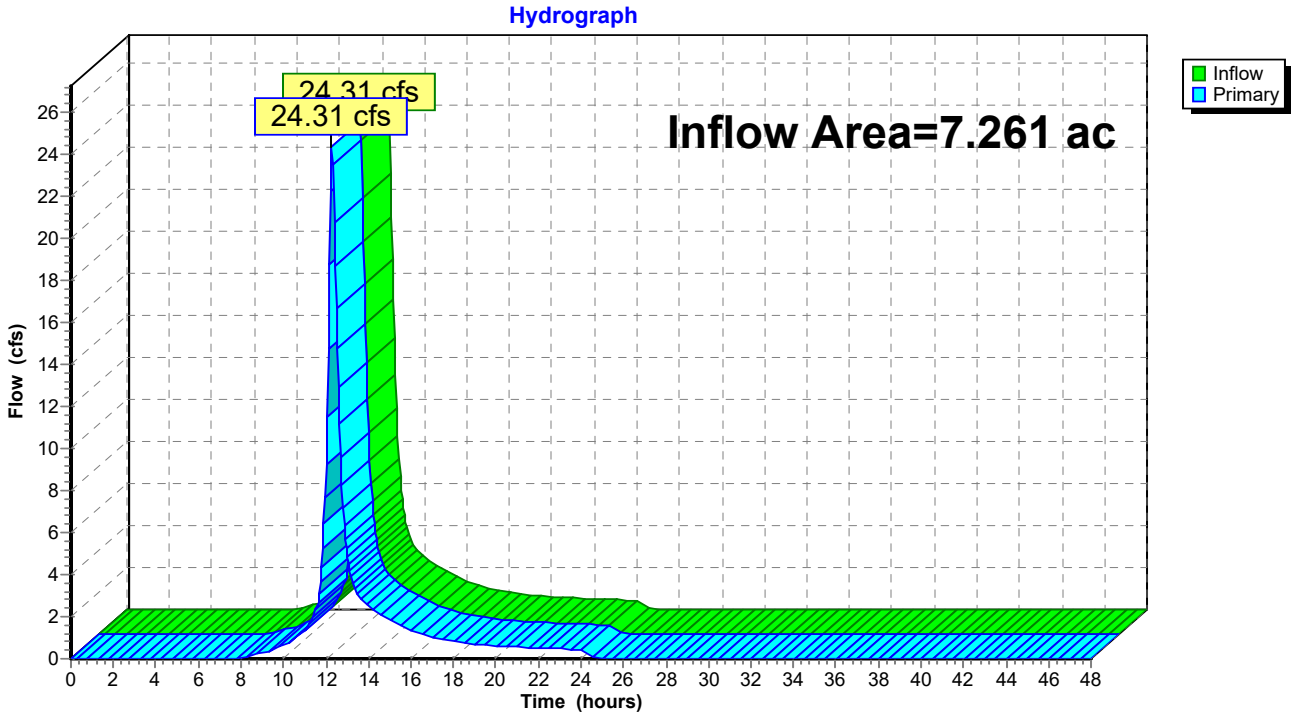


Summary for Link AP-2: AP-2

Inflow Area = 7.261 ac, 0.00% Impervious, Inflow Depth = 4.26" for 25 YR event
Inflow = 24.31 cfs @ 12.28 hrs, Volume= 2.580 af
Primary = 24.31 cfs @ 12.28 hrs, Volume= 2.580 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link AP-2: AP-2

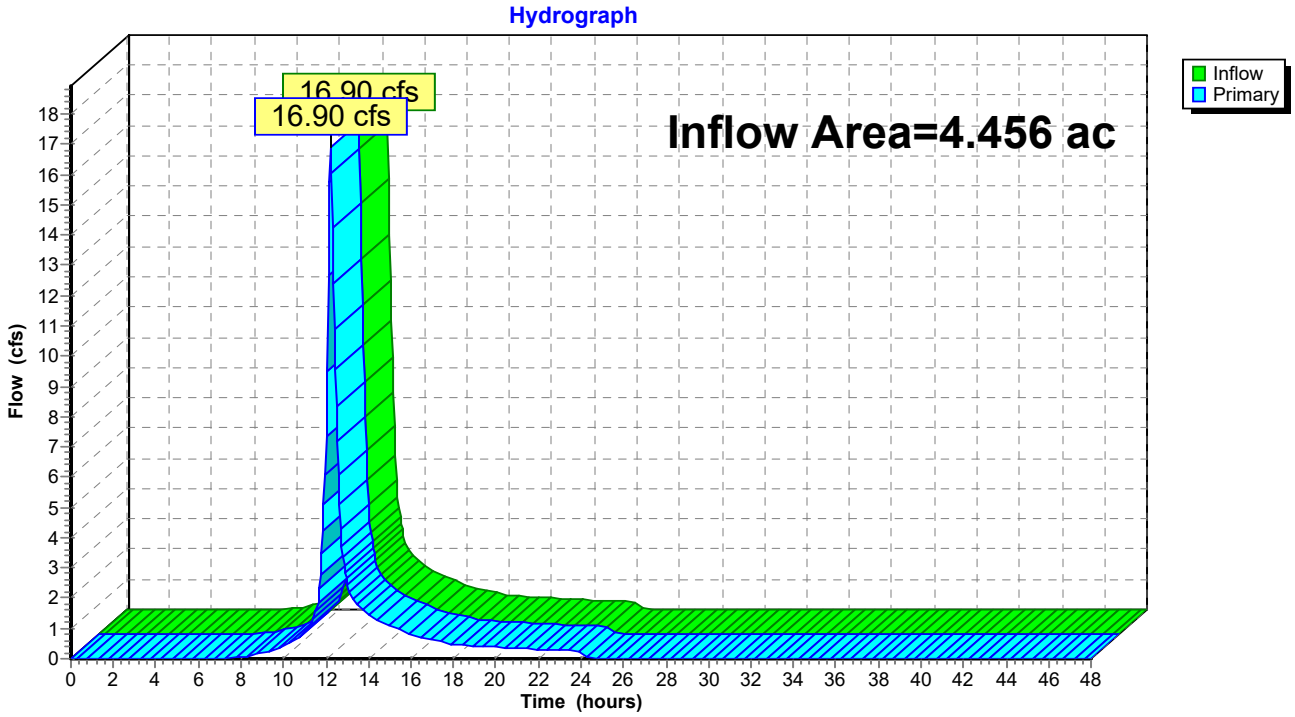


Summary for Link AP-3: AP-3

Inflow Area = 4.456 ac, 0.00% Impervious, Inflow Depth = 4.26" for 25 YR event
Inflow = 16.90 cfs @ 12.20 hrs, Volume= 1.583 af
Primary = 16.90 cfs @ 12.20 hrs, Volume= 1.583 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link AP-3: AP-3



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EDA-1: EDA-1 Runoff Area=6.449 ac 0.00% Impervious Runoff Depth=4.68"
Flow Length=417' Tc=34.4 min CN=71 Runoff=18.76 cfs 2.517 af

Subcatchment EDA-2: EDA-2 Runoff Area=7.261 ac 0.00% Impervious Runoff Depth=5.15"
Flow Length=388' Tc=20.1 min CN=75 Runoff=29.36 cfs 3.116 af

Subcatchment EDA-3: EDA-3 Runoff Area=4.456 ac 0.00% Impervious Runoff Depth=5.15"
Flow Length=667' Tc=14.7 min CN=75 Runoff=20.36 cfs 1.912 af

Link AP-1: AP-1 Inflow=18.76 cfs 2.517 af
Primary=18.76 cfs 2.517 af

Link AP-2: AP-2 Inflow=29.36 cfs 3.116 af
Primary=29.36 cfs 3.116 af

Link AP-3: AP-3 Inflow=20.36 cfs 1.912 af
Primary=20.36 cfs 1.912 af

Total Runoff Area = 18.166 ac Runoff Volume = 7.546 af Average Runoff Depth = 4.98"
100.00% Pervious = 18.166 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment EDA-1: EDA-1

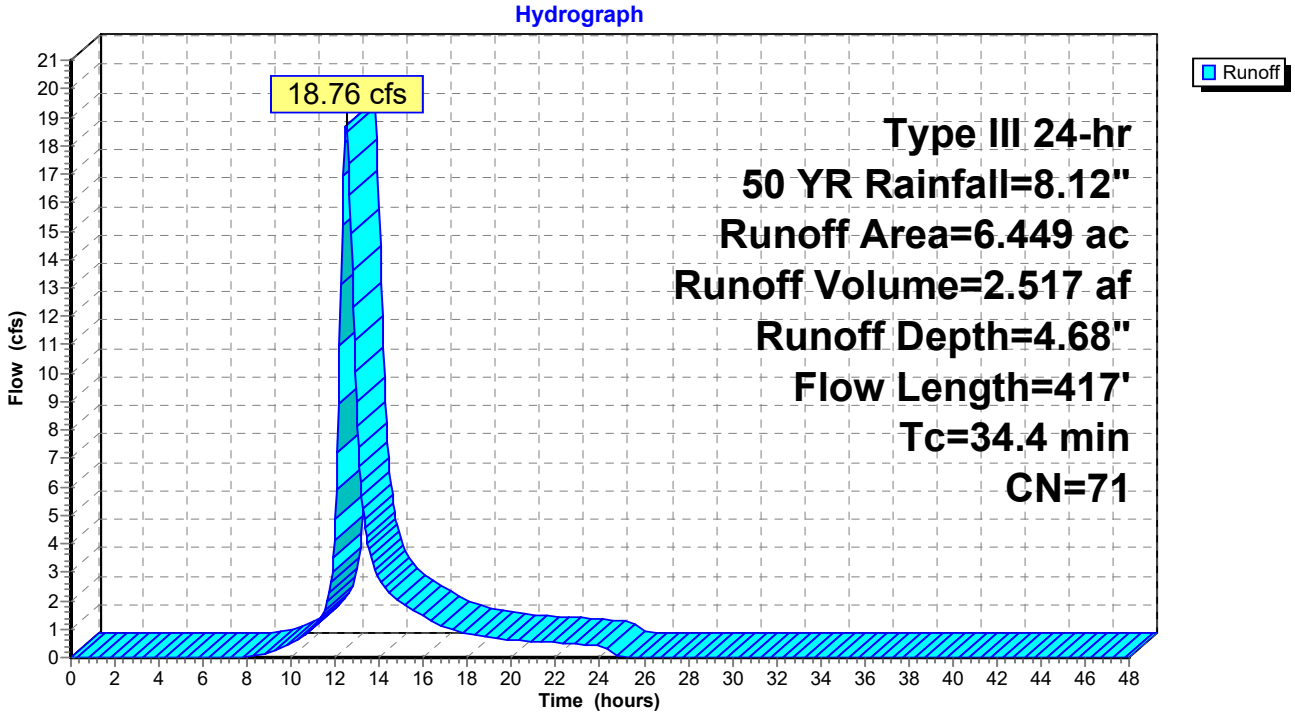
Runoff = 18.76 cfs @ 12.48 hrs, Volume= 2.517 af, Depth= 4.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YR Rainfall=8.12"

Area (ac)	CN	Description
0.156	55	Woods, Good, HSG B
0.166	56	Brush, Fair, HSG B
0.323	70	Woods, Good, HSG C
4.514	70	Brush, Fair, HSG C
0.097	77	Woods, Good, HSG D
1.193	77	Brush, Fair, HSG D
6.449	71	Weighted Average
6.449		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.8	100	0.0070	0.05		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.61"
3.0	245	0.0744	1.36		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.6	72	0.1573	1.98		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
34.4	417	Total			

Subcatchment EDA-1: EDA-1



Summary for Subcatchment EDA-2: EDA-2

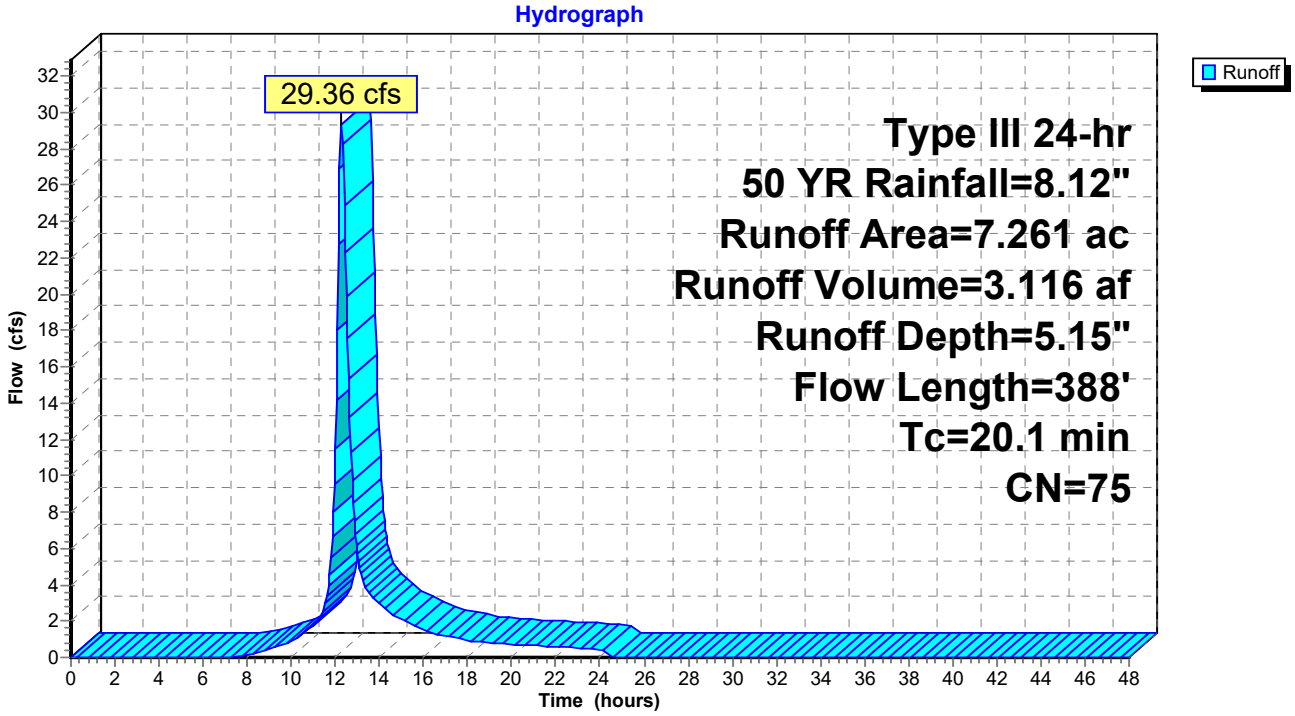
Runoff = 29.36 cfs @ 12.27 hrs, Volume= 3.116 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YR Rainfall=8.12"

Area (ac)	CN	Description
1.981	70	Brush, Fair, HSG C
2.215	74	Pasture/grassland/range, Good, HSG C
0.621	77	Brush, Fair, HSG D
2.444	80	Pasture/grassland/range, Good, HSG D
7.261	75	Weighted Average
7.261		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6	100	0.0118	0.10		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.61"
3.5	288	0.0387	1.38		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
20.1	388	Total			

Subcatchment EDA-2: EDA-2



Summary for Subcatchment EDA-3: EDA-3

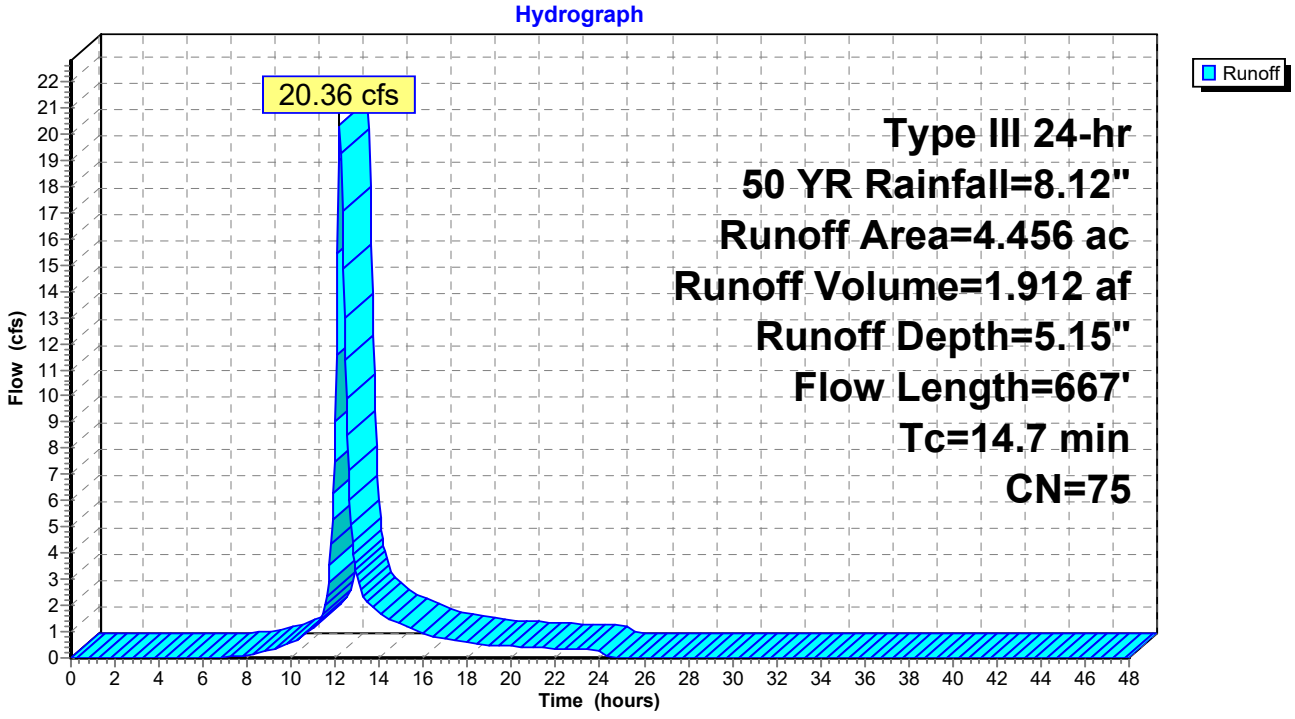
Runoff = 20.36 cfs @ 12.20 hrs, Volume= 1.912 af, Depth= 5.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YR Rainfall=8.12"

Area (ac)	CN	Description
3.626	74	Pasture/grassland/range, Good, HSG C
0.001	77	Brush, Fair, HSG D
0.829	80	Pasture/grassland/range, Good, HSG D
4.456	75	Weighted Average
4.456		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0503	0.18		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.61"
5.4	567	0.0628	1.75		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
14.7	667	Total			

Subcatchment EDA-3: EDA-3

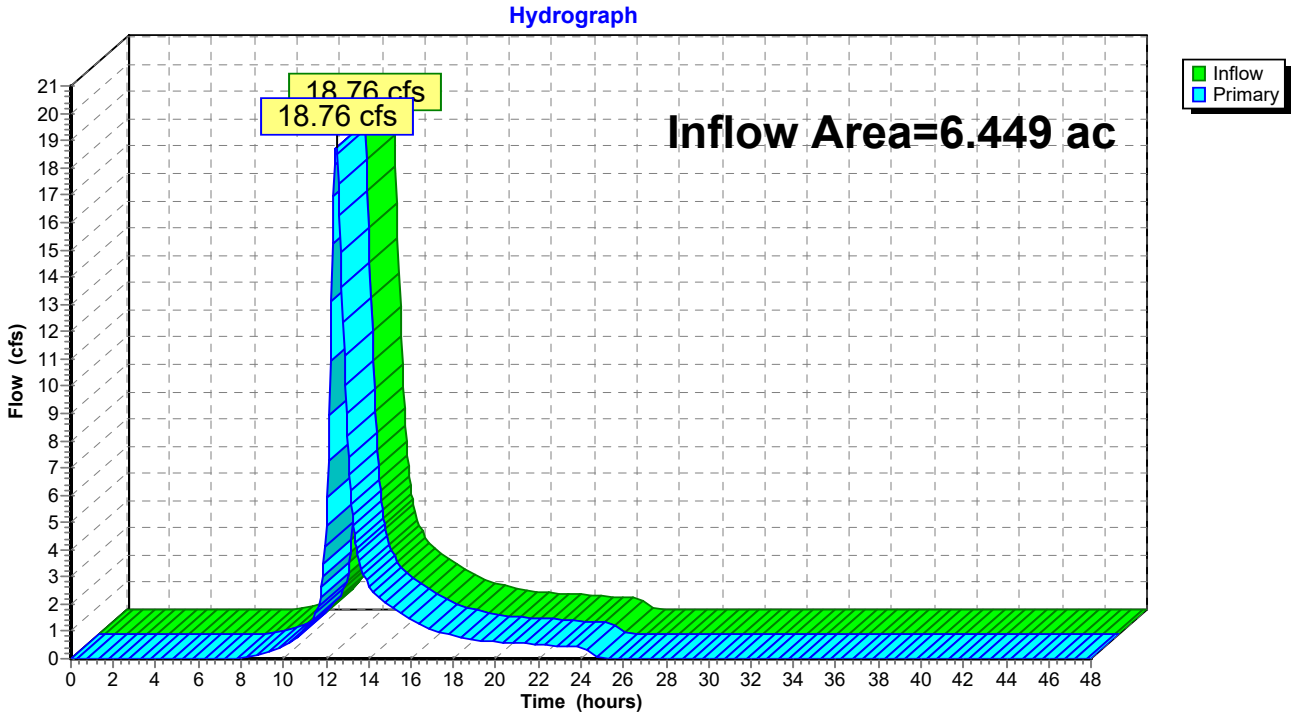


Summary for Link AP-1: AP-1

Inflow Area = 6.449 ac, 0.00% Impervious, Inflow Depth = 4.68" for 50 YR event
Inflow = 18.76 cfs @ 12.48 hrs, Volume= 2.517 af
Primary = 18.76 cfs @ 12.48 hrs, Volume= 2.517 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link AP-1: AP-1

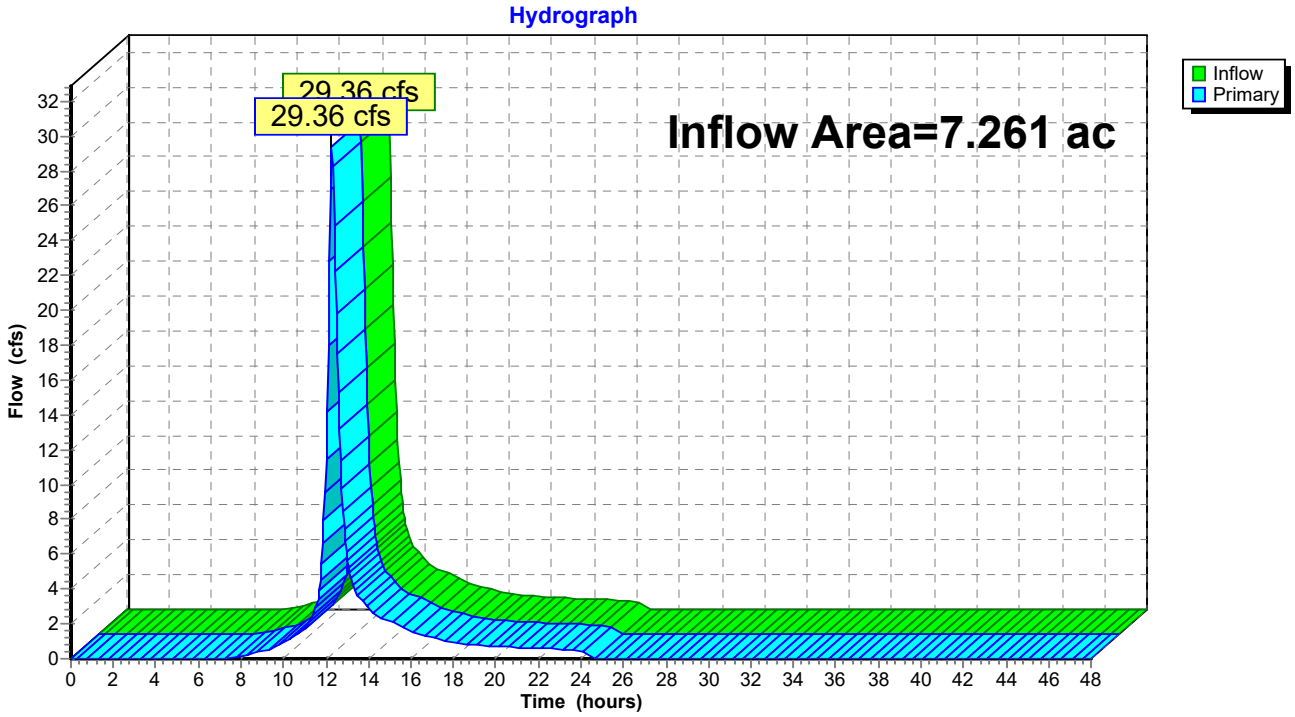


Summary for Link AP-2: AP-2

Inflow Area = 7.261 ac, 0.00% Impervious, Inflow Depth = 5.15" for 50 YR event
Inflow = 29.36 cfs @ 12.27 hrs, Volume= 3.116 af
Primary = 29.36 cfs @ 12.27 hrs, Volume= 3.116 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link AP-2: AP-2

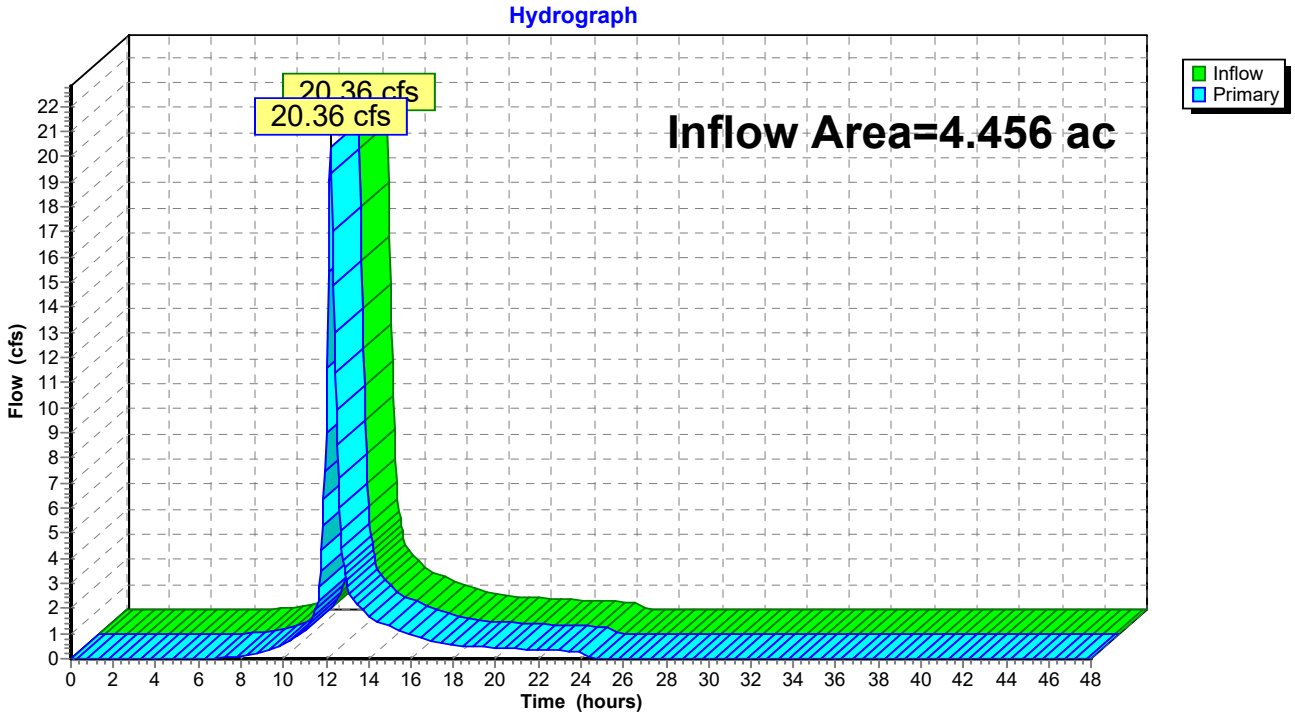


Summary for Link AP-3: AP-3

Inflow Area = 4.456 ac, 0.00% Impervious, Inflow Depth = 5.15" for 50 YR event
Inflow = 20.36 cfs @ 12.20 hrs, Volume= 1.912 af
Primary = 20.36 cfs @ 12.20 hrs, Volume= 1.912 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link AP-3: AP-3



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment EDA-1: EDA-1 Runoff Area=6.449 ac 0.00% Impervious Runoff Depth=5.65"
Flow Length=417' Tc=34.4 min CN=71 Runoff=22.59 cfs 3.034 af

Subcatchment EDA-2: EDA-2 Runoff Area=7.261 ac 0.00% Impervious Runoff Depth=6.15"
Flow Length=388' Tc=20.1 min CN=75 Runoff=34.92 cfs 3.719 af

Subcatchment EDA-3: EDA-3 Runoff Area=4.456 ac 0.00% Impervious Runoff Depth=6.15"
Flow Length=667' Tc=14.7 min CN=75 Runoff=24.20 cfs 2.282 af

Link AP-1: AP-1 Inflow=22.59 cfs 3.034 af
Primary=22.59 cfs 3.034 af

Link AP-2: AP-2 Inflow=34.92 cfs 3.719 af
Primary=34.92 cfs 3.719 af

Link AP-3: AP-3 Inflow=24.20 cfs 2.282 af
Primary=24.20 cfs 2.282 af

Total Runoff Area = 18.166 ac Runoff Volume = 9.035 af Average Runoff Depth = 5.97"
100.00% Pervious = 18.166 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment EDA-1: EDA-1

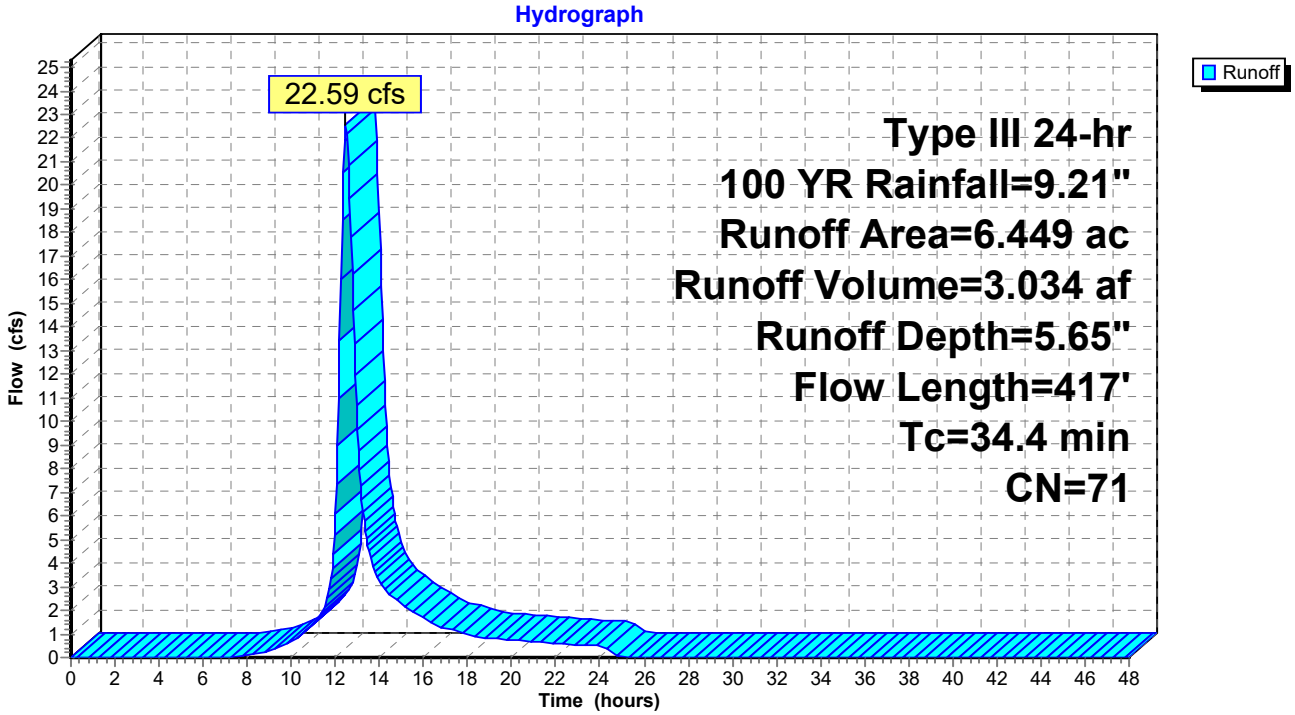
Runoff = 22.59 cfs @ 12.48 hrs, Volume= 3.034 af, Depth= 5.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=9.21"

Area (ac)	CN	Description
0.156	55	Woods, Good, HSG B
0.166	56	Brush, Fair, HSG B
0.323	70	Woods, Good, HSG C
4.514	70	Brush, Fair, HSG C
0.097	77	Woods, Good, HSG D
1.193	77	Brush, Fair, HSG D
6.449	71	Weighted Average
6.449		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
30.8	100	0.0070	0.05		**Sheet Flow, A-B** Woods: Light underbrush n= 0.400 P2= 3.61"
3.0	245	0.0744	1.36		**Shallow Concentrated Flow, B-C** Woodland Kv= 5.0 fps
0.6	72	0.1573	1.98		**Shallow Concentrated Flow, C-D** Woodland Kv= 5.0 fps
34.4	417	Total			

Subcatchment EDA-1: EDA-1



Summary for Subcatchment EDA-2: EDA-2

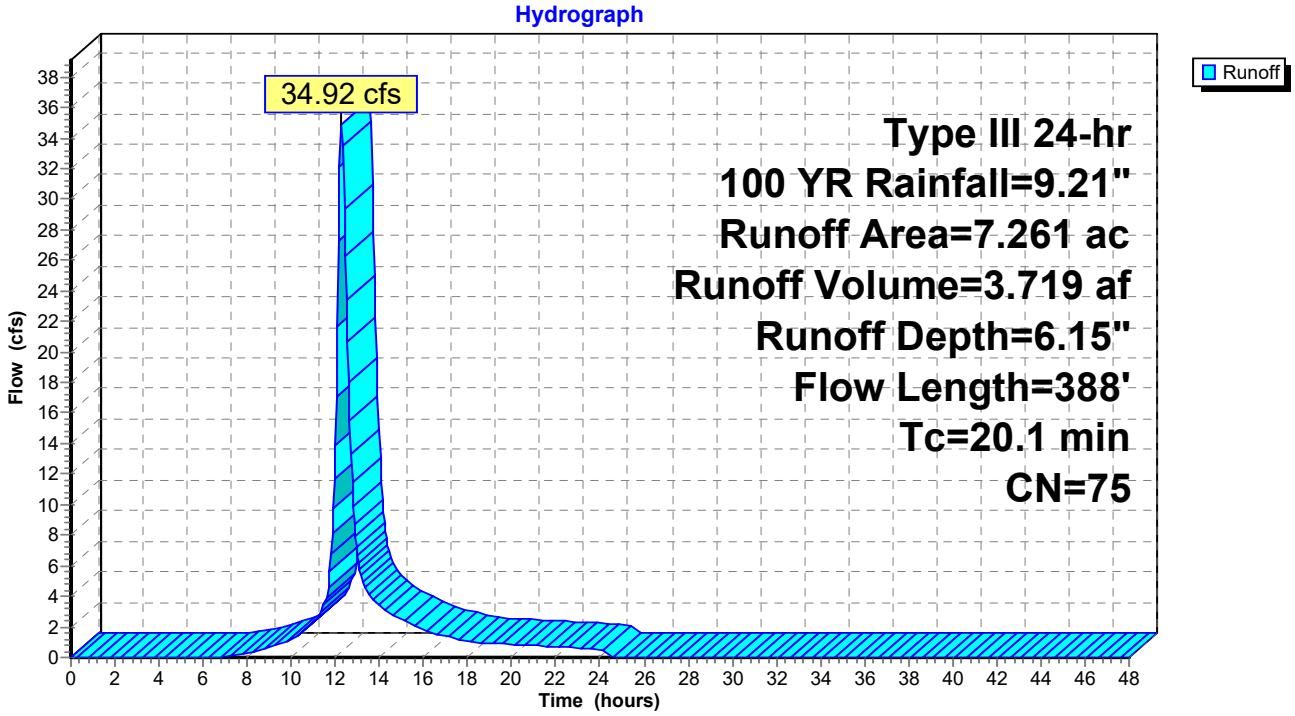
Runoff = 34.92 cfs @ 12.27 hrs, Volume= 3.719 af, Depth= 6.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=9.21"

Area (ac)	CN	Description
1.981	70	Brush, Fair, HSG C
2.215	74	Pasture/grassland/range, Good, HSG C
0.621	77	Brush, Fair, HSG D
2.444	80	Pasture/grassland/range, Good, HSG D
7.261	75	Weighted Average
7.261		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6	100	0.0118	0.10		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.61"
3.5	288	0.0387	1.38		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
20.1	388	Total			

Subcatchment EDA-2: EDA-2



Summary for Subcatchment EDA-3: EDA-3

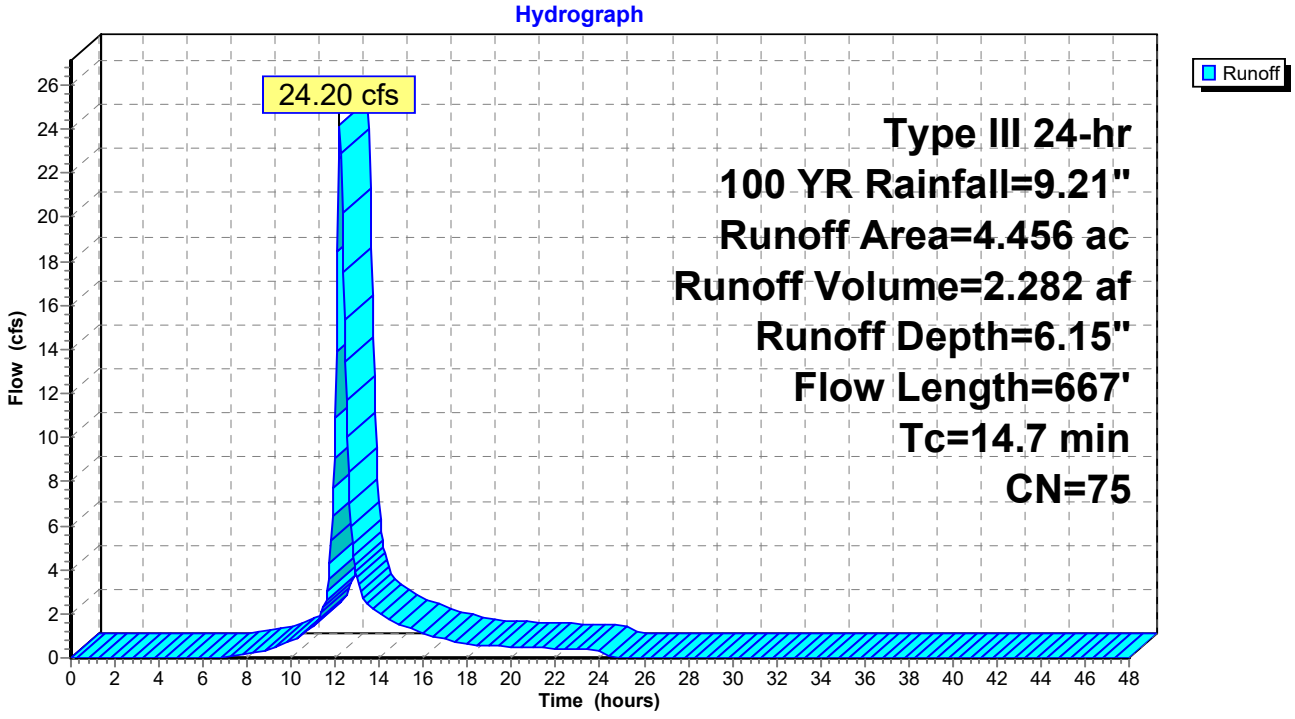
Runoff = 24.20 cfs @ 12.20 hrs, Volume= 2.282 af, Depth= 6.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=9.21"

Area (ac)	CN	Description
3.626	74	Pasture/grassland/range, Good, HSG C
0.001	77	Brush, Fair, HSG D
0.829	80	Pasture/grassland/range, Good, HSG D
4.456	75	Weighted Average
4.456		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0503	0.18		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.61"
5.4	567	0.0628	1.75		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
14.7	667	Total			

Subcatchment EDA-3: EDA-3

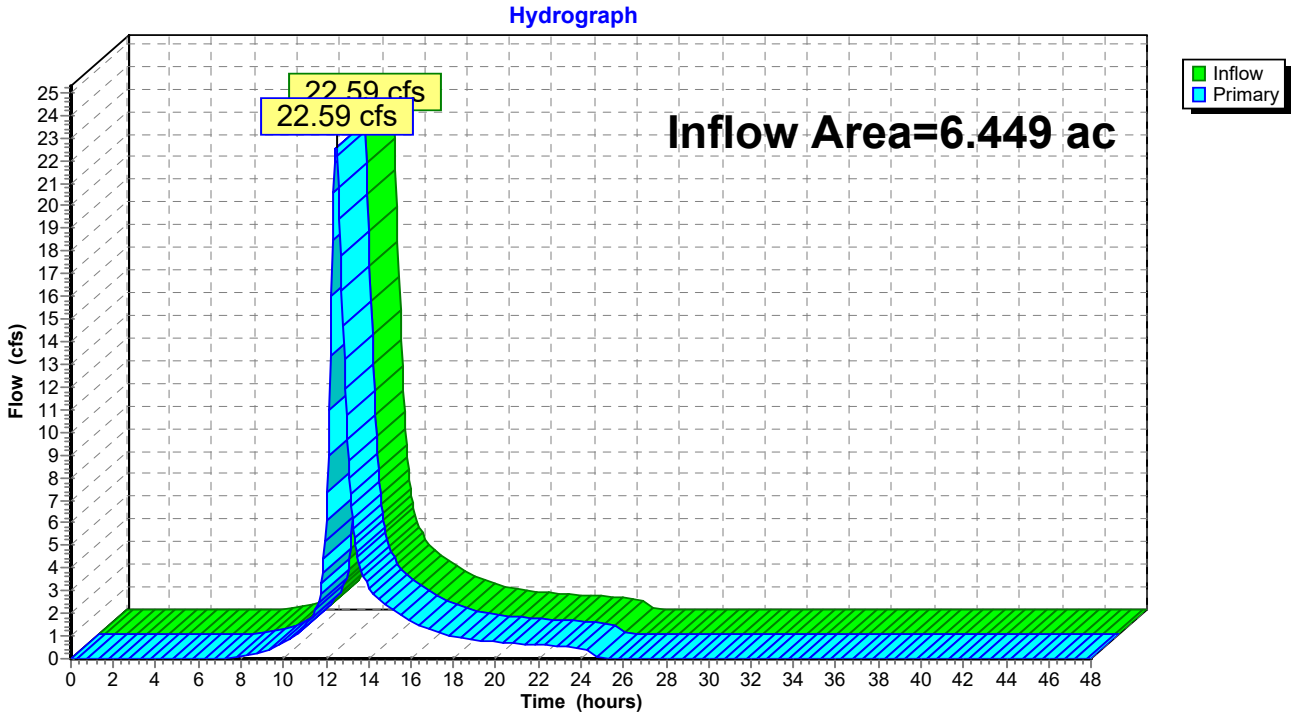


Summary for Link AP-1: AP-1

Inflow Area = 6.449 ac, 0.00% Impervious, Inflow Depth = 5.65" for 100 YR event
Inflow = 22.59 cfs @ 12.48 hrs, Volume= 3.034 af
Primary = 22.59 cfs @ 12.48 hrs, Volume= 3.034 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link AP-1: AP-1

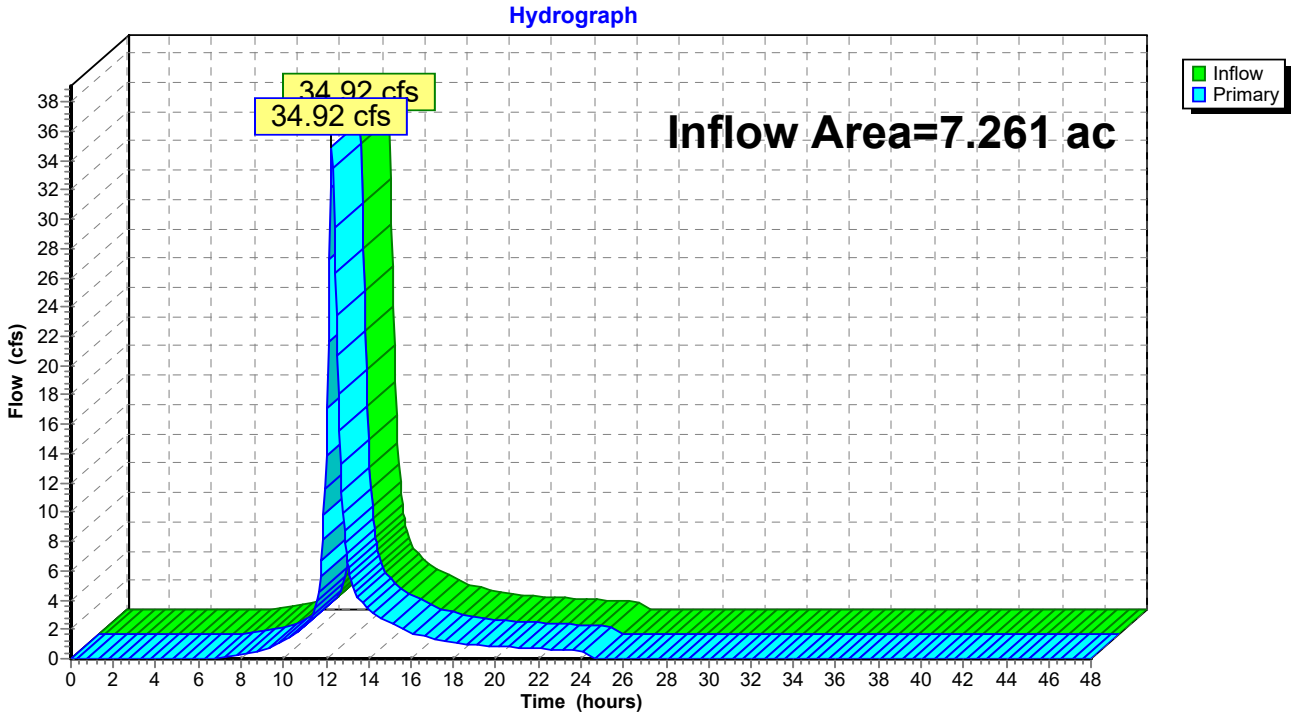


Summary for Link AP-2: AP-2

Inflow Area = 7.261 ac, 0.00% Impervious, Inflow Depth = 6.15" for 100 YR event
Inflow = 34.92 cfs @ 12.27 hrs, Volume= 3.719 af
Primary = 34.92 cfs @ 12.27 hrs, Volume= 3.719 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link AP-2: AP-2

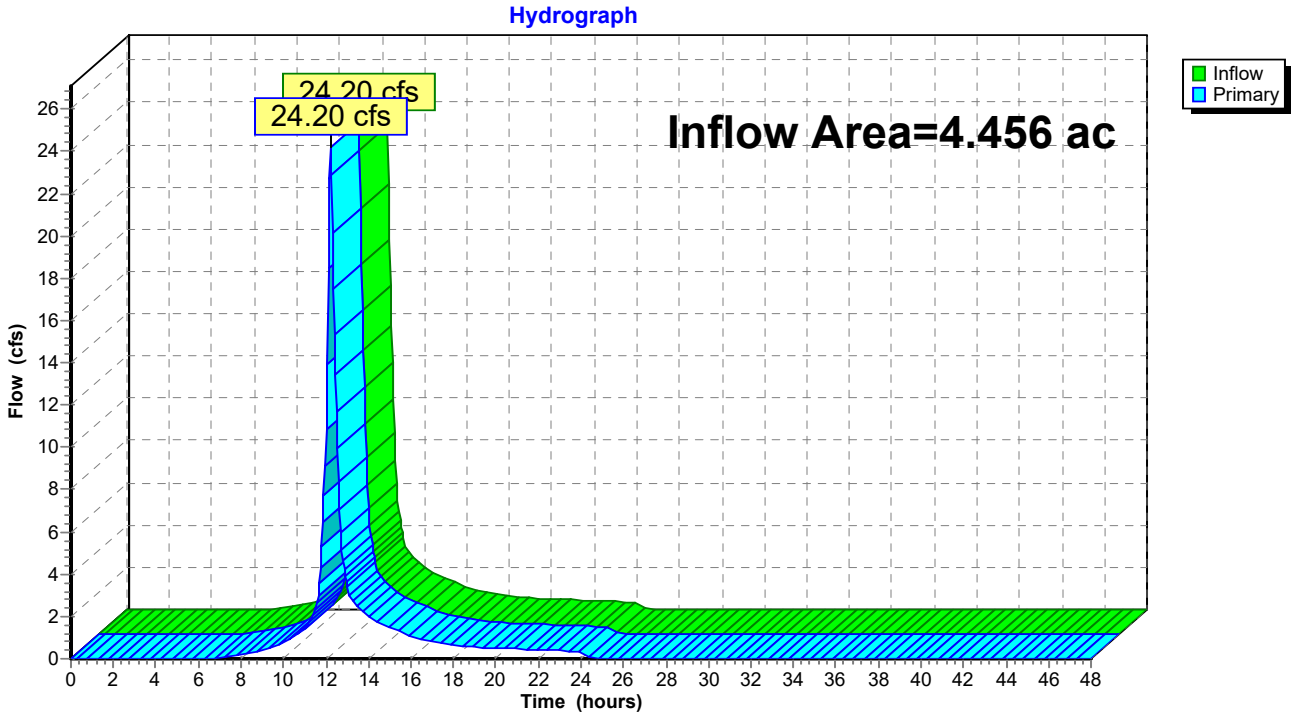


Summary for Link AP-3: AP-3

Inflow Area = 4.456 ac, 0.00% Impervious, Inflow Depth = 6.15" for 100 YR event
Inflow = 24.20 cfs @ 12.20 hrs, Volume= 2.282 af
Primary = 24.20 cfs @ 12.20 hrs, Volume= 2.282 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

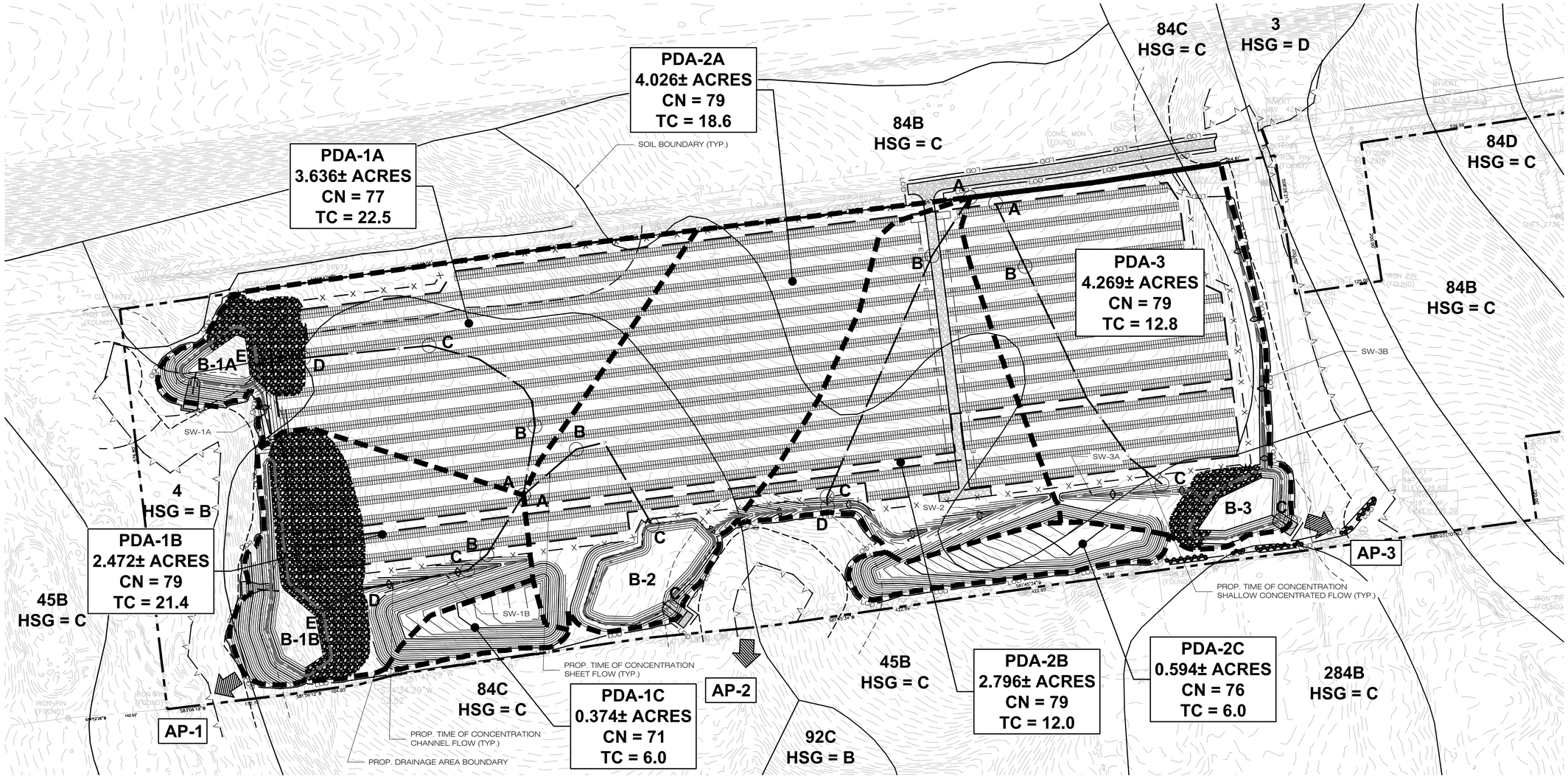
Link AP-3: AP-3



APPENDIX C: PROPOSED DRAINAGE AREA MAP (PDA-1) & HYDROLOGIC COMPUTATION (HYDROCAD)

PROPOSED DRAINAGE AREAS

	TOTAL AREA (ACRES)	COMPOSITE CN	TC (MINS.)
PDA-1A	0.255±	77	22.5
PDA-1B	2.472±	79	21.4
PDA-1C	0.374±	71	6.0
PDA-2A	4.026±	79	18.6
PDA-2B	2.796±	79	12.0
PDA-2C	0.594±	76	6.0
PDA-3	4.269±	79	12.8



1 PDA-1 **PROPOSED DRAINAGE AREA MAP**
SCALE : 1" = 80'-0"

80 0 40 80 160
(IN FEET) 1 inch = 80 ft.

BRISTOL SOLAR ONE, LLC

150 TRUMBULL STREET
4TH FLOOR
HARTFORD, CT, 06103

ALL-POINTS TECHNOLOGY CORPORATION

567 VAUXHAUL STREET EXTENSION - SUITE 311
WATERFORD, CT 06385 PHONE: (860)-663-1697
WWW.ALLPOINTSTECH.COM FAX: (860)-663-0935

PERMIT SET

NO	DATE	REVISION
0	05/20/20	FOR REVIEW: BJP
1		
2		
3		
4		
5		
6		

NOT FOR CONSTRUCTION

DESIGN PROFESSIONAL OF RECORD

PROF: BRADLEY J. PARSONS P.E.
COMP: ALL-POINTS TECHNOLOGY CORPORATION
ADD: 567 VAUXHAUL STREET EXTENSION - SUITE 311 WATERFORD, CT 06385

OWNER: MARK E., ANN L. & PAUL C. MINOR
ADDRESS: 399 HILL STREET BRISTOL, CT

BRISTOL SOLAR ONE, LLC

SITE ADDRESS: 399 HILL STREET BRISTOL, CT

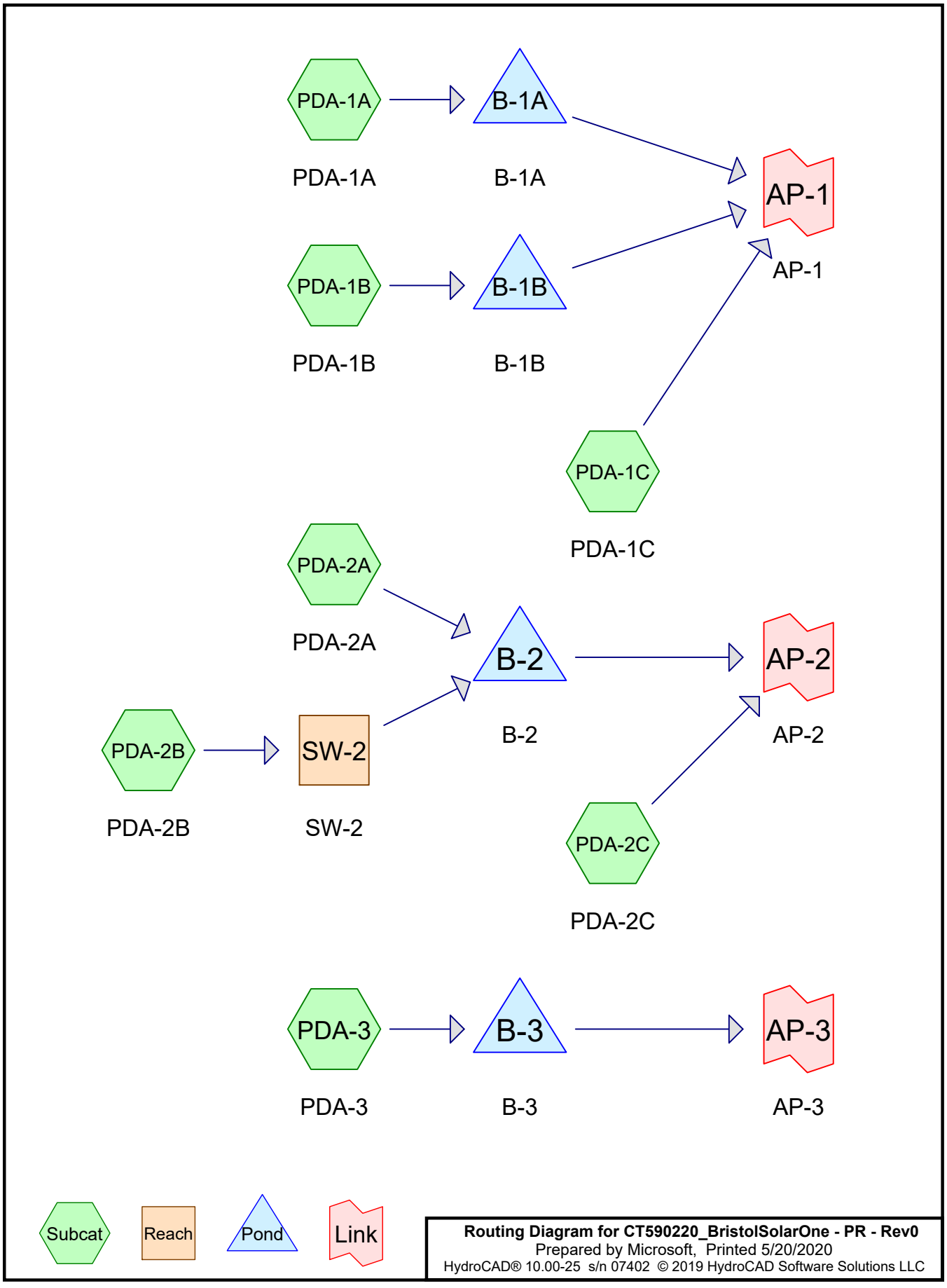
APT FILING NUMBER: CT590220

DRAWN BY: JT

DATE: 05/20/20 CHECKED BY: BJP

SHEET TITLE:
PROPOSED DRAINAGE AREA MAP

SHEET NUMBER:
PDA-1



Routing Diagram for CT590220_BristolSolarOne - PR - Rev0
Prepared by Microsoft, Printed 5/20/2020
HydroCAD® 10.00-25 s/n 07402 © 2019 HydroCAD Software Solutions LLC

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.164	96	Gravel surface, HSG D (PDA-2A, PDA-2B)
0.852	71	Meadow, non-grazed, HSG C (PDA-1A, PDA-1B, PDA-1C, PDA-2C)
16.563	78	Meadow, non-grazed, HSG D (PDA-1A, PDA-1B, PDA-2A, PDA-2B, PDA-2C, PDA-3)
0.588	98	Water Surface, HSG D (PDA-1B, PDA-2A, PDA-3)
18.167	**78**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
0.852	HSG C	PDA-1A, PDA-1B, PDA-1C, PDA-2C
17.315	HSG D	PDA-1A, PDA-1B, PDA-2A, PDA-2B, PDA-2C, PDA-3
0.000	Other	
18.167		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.164	0.000	0.164	Gravel surface	PDA-2A, PDA-2B
0.000	0.000	0.852	16.563	0.000	17.415	Meadow, non-grazed	PDA-1A, PDA-1B, PDA-1C, PDA-2A, PDA-2B, PDA-2C, PDA-3
0.000	0.000	0.000	0.588	0.000	0.588	Water Surface	PDA-1B, PDA-2A, PDA-3
0.000	**0.000**	**0.852**	**17.315**	**0.000**	**18.167**	**TOTAL AREA**	

Pipe Listing (all nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	B-1A	697.00	696.00	31.0	0.0323	0.013	15.0	0.0	0.0
2	B-1B	698.00	697.00	30.0	0.0333	0.013	15.0	0.0	0.0
3	B-2	720.50	720.00	34.0	0.0147	0.013	12.0	0.0	0.0
4	B-3	735.50	735.00	28.0	0.0179	0.013	12.0	0.0	0.0

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PDA-1A: PDA-1A Runoff Area=3.636 ac 0.00% Impervious Runoff Depth=1.51"
Flow Length=552' Tc=22.5 min CN=77 Runoff=4.05 cfs 0.458 af

Subcatchment PDA-1B: PDA-1B Runoff Area=2.472 ac 6.88% Impervious Runoff Depth=1.65"
Flow Length=357' Tc=21.4 min CN=79 Runoff=3.10 cfs 0.340 af

Subcatchment PDA-1C: PDA-1C Runoff Area=0.374 ac 0.00% Impervious Runoff Depth=1.13"
Tc=6.0 min CN=71 Runoff=0.46 cfs 0.035 af

Subcatchment PDA-2A: PDA-2A Runoff Area=4.026 ac 7.03% Impervious Runoff Depth=1.65"
Flow Length=278' Tc=18.6 min CN=79 Runoff=5.35 cfs 0.554 af

Subcatchment PDA-2B: PDA-2B Runoff Area=2.796 ac 0.00% Impervious Runoff Depth=1.65"
Flow Length=491' Tc=12.0 min CN=79 Runoff=4.38 cfs 0.385 af

Subcatchment PDA-2C: PDA-2C Runoff Area=0.594 ac 0.00% Impervious Runoff Depth=1.45"
Tc=6.0 min CN=76 Runoff=0.97 cfs 0.072 af

Subcatchment PDA-3: PDA-3 Runoff Area=4.269 ac 3.16% Impervious Runoff Depth=1.65"
Flow Length=473' Tc=12.8 min CN=79 Runoff=6.50 cfs 0.588 af

Reach SW-2: SW-2 Avg. Flow Depth=0.27' Max Vel=4.22 fps Inflow=4.38 cfs 0.385 af
n=0.030 L=518.8' S=0.0558 '/' Capacity=122.75 cfs Outflow=4.29 cfs 0.385 af

Pond B-1A: B-1A Peak Elev=697.92' Storage=3,329 cf Inflow=4.05 cfs 0.458 af
Outflow=3.16 cfs 0.458 af

Pond B-1B: B-1B Peak Elev=700.06' Storage=13,979 cf Inflow=3.10 cfs 0.340 af
Outflow=1.05 cfs 0.340 af

Pond B-2: B-2 Peak Elev=723.06' Storage=25,974 cf Inflow=9.38 cfs 0.939 af
Outflow=2.83 cfs 0.938 af

Pond B-3: B-3 Peak Elev=737.00' Storage=11,686 cf Inflow=6.50 cfs 0.588 af
Outflow=3.77 cfs 0.587 af

Link AP-1: AP-1 Inflow=4.09 cfs 0.833 af
Primary=4.09 cfs 0.833 af

Link AP-2: AP-2 Inflow=2.97 cfs 1.009 af
Primary=2.97 cfs 1.009 af

Link AP-3: AP-3 Inflow=3.77 cfs 0.587 af
Primary=3.77 cfs 0.587 af

Total Runoff Area = 18.167 ac Runoff Volume = 2.432 af Average Runoff Depth = 1.61"
96.76% Pervious = 17.579 ac 3.24% Impervious = 0.588 ac

Summary for Subcatchment PDA-1A: PDA-1A

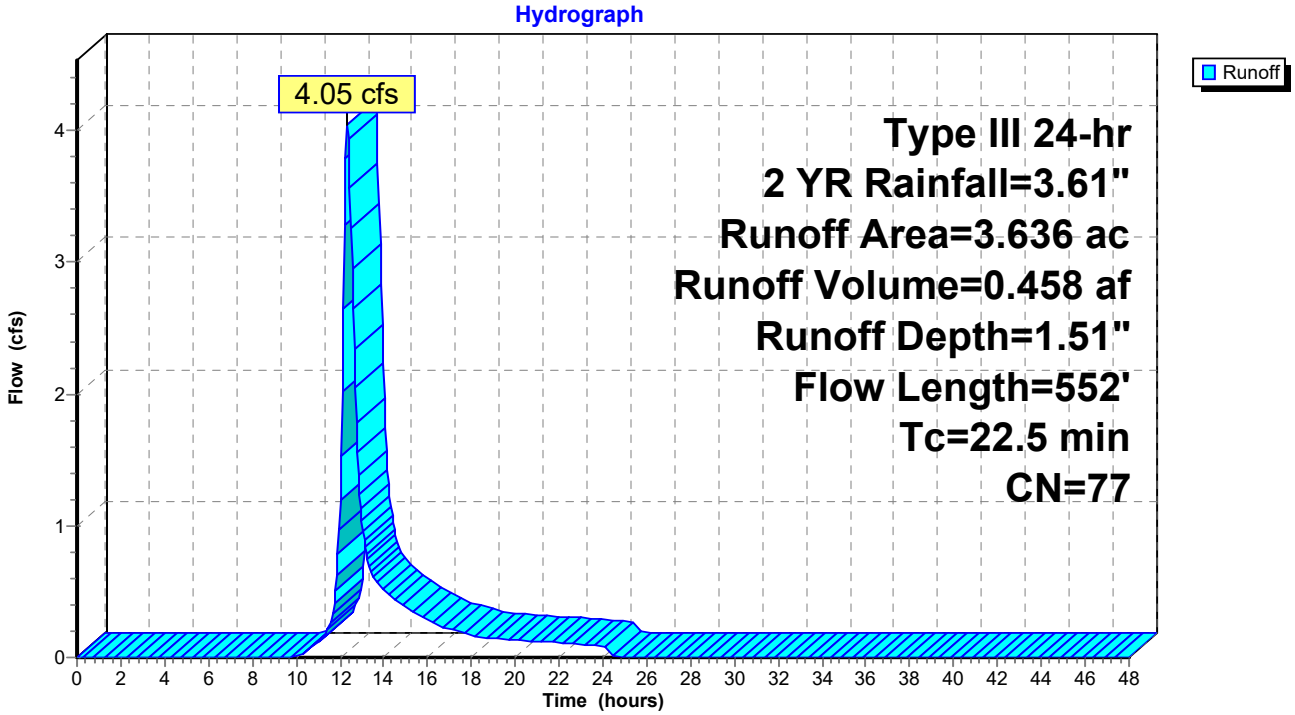
Runoff = 4.05 cfs @ 12.33 hrs, Volume= 0.458 af, Depth= 1.51"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.61"

Area (ac)	CN	Description
0.308	71	Meadow, non-grazed, HSG C
3.328	78	Meadow, non-grazed, HSG D
3.636	77	Weighted Average
3.636		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0104	0.10		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.61"
3.1	203	0.0238	1.08		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.6	181	0.0761	1.93		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
0.3	68	0.3333	4.04		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
22.5	552	Total			

Subcatchment PDA-1A: PDA-1A



Summary for Subcatchment PDA-1B: PDA-1B

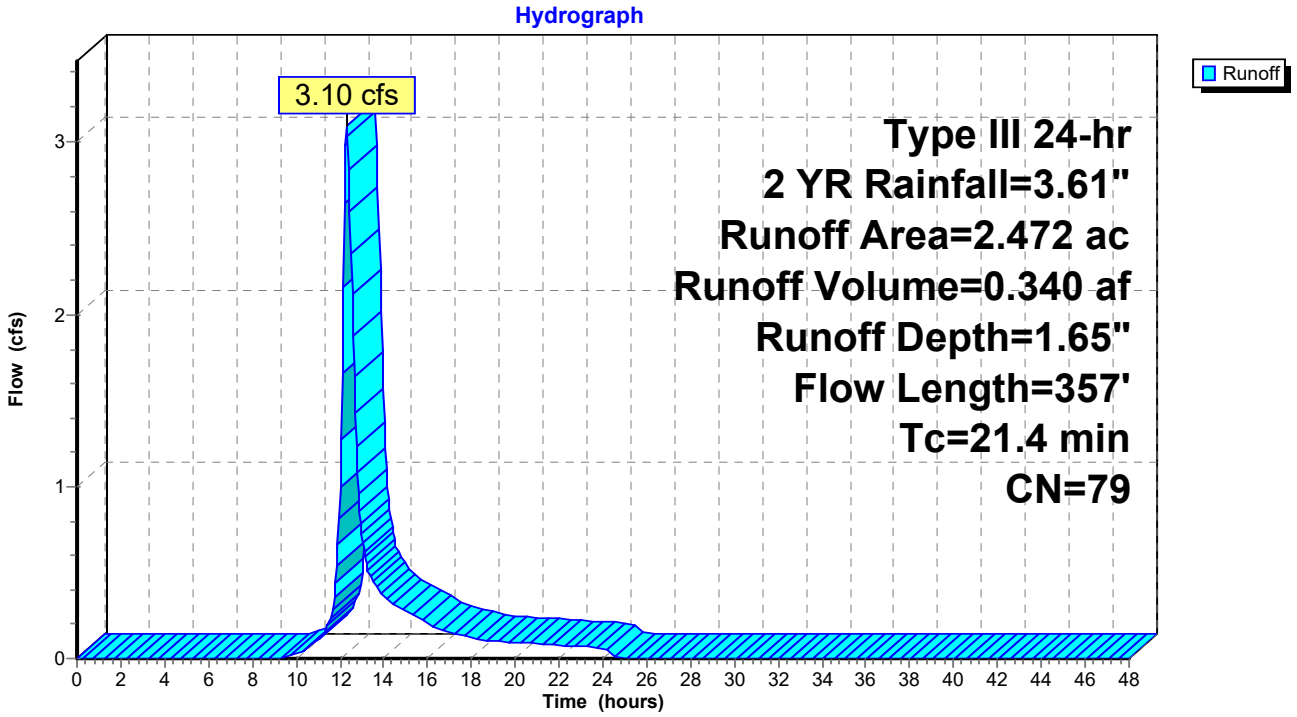
Runoff = 3.10 cfs @ 12.31 hrs, Volume= 0.340 af, Depth= 1.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.61"

Area (ac)	CN	Description
0.014	71	Meadow, non-grazed, HSG C
2.288	78	Meadow, non-grazed, HSG D
0.170	98	Water Surface, HSG D
2.472	79	Weighted Average
2.302		93.12% Pervious Area
0.170		6.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.4	100	0.0070	0.08		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.61"
0.5	36	0.0338	1.29		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.3	162	0.0500	10.58	118.47	**Channel Flow, D-E** Area= 11.2 sf Perim= 12.0' r= 0.93' n= 0.030 Earth, grassed & winding
0.2	59	0.3333	4.04		**Shallow Concentrated Flow, E-F** Short Grass Pasture Kv= 7.0 fps
21.4	357	Total			

Subcatchment PDA-1B: PDA-1B



Summary for Subcatchment PDA-1C: PDA-1C

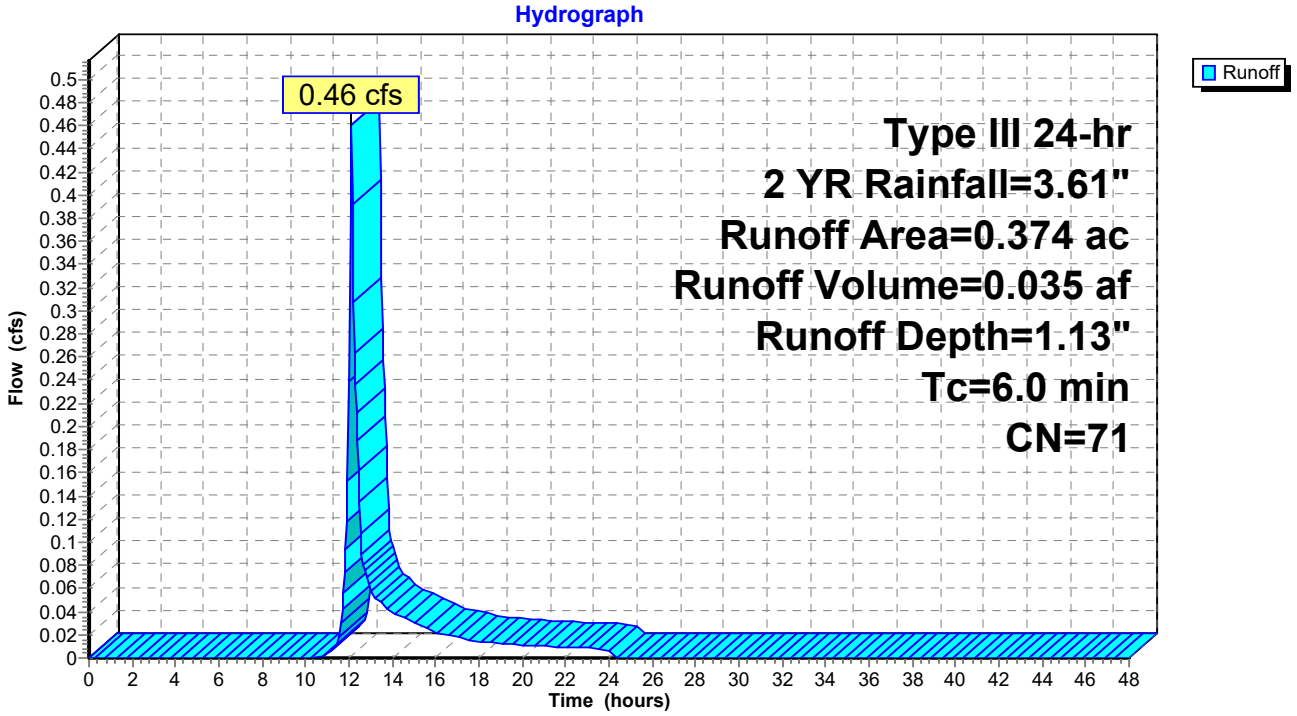
Runoff = 0.46 cfs @ 12.10 hrs, Volume= 0.035 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.61"

Area (ac)	CN	Description
0.374	71	Meadow, non-grazed, HSG C
0.374		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PDA-1C: PDA-1C



Summary for Subcatchment PDA-2A: PDA-2A

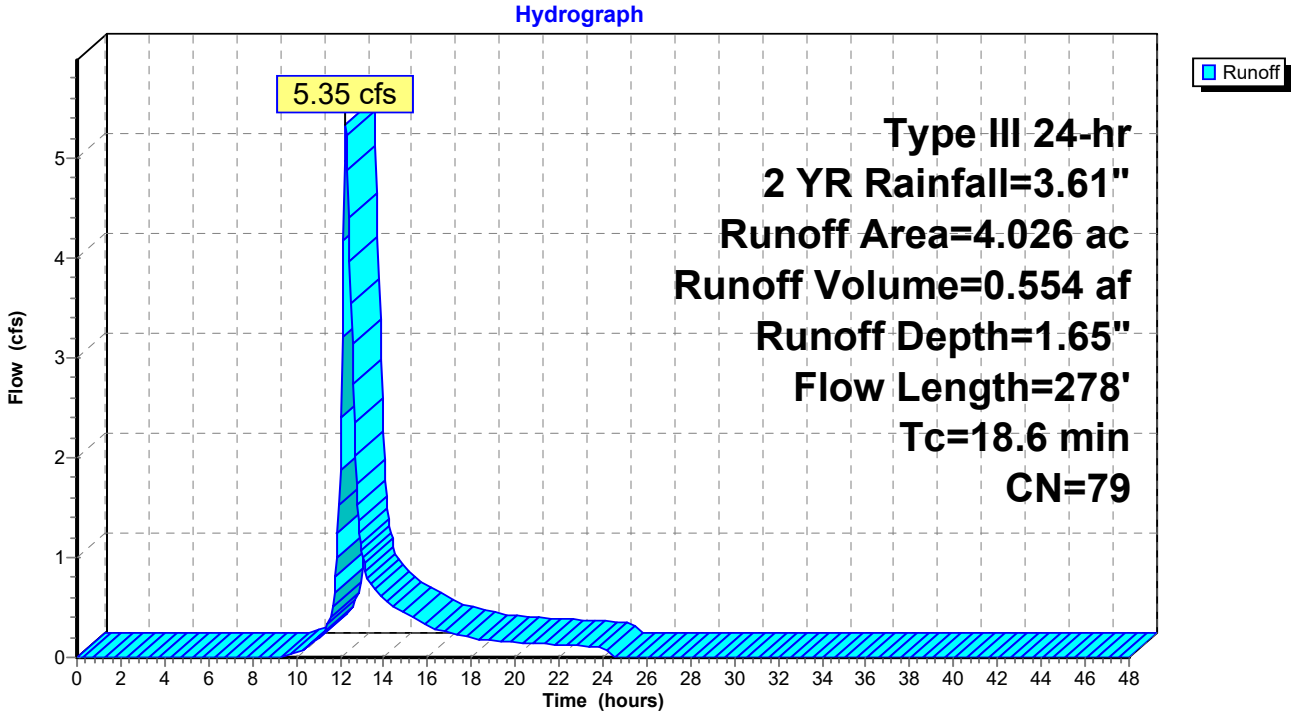
Runoff = 5.35 cfs @ 12.27 hrs, Volume= 0.554 af, Depth= 1.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.61"

Area (ac)	CN	Description
3.742	78	Meadow, non-grazed, HSG D
0.001	96	Gravel surface, HSG D
0.283	98	Water Surface, HSG D
4.026	79	Weighted Average
3.743		92.97% Pervious Area
0.283		7.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6	100	0.0118	0.10		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.61"
2.0	178	0.0428	1.45		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
18.6	278	Total			

Subcatchment PDA-2A: PDA-2A



Summary for Subcatchment PDA-2B: PDA-2B

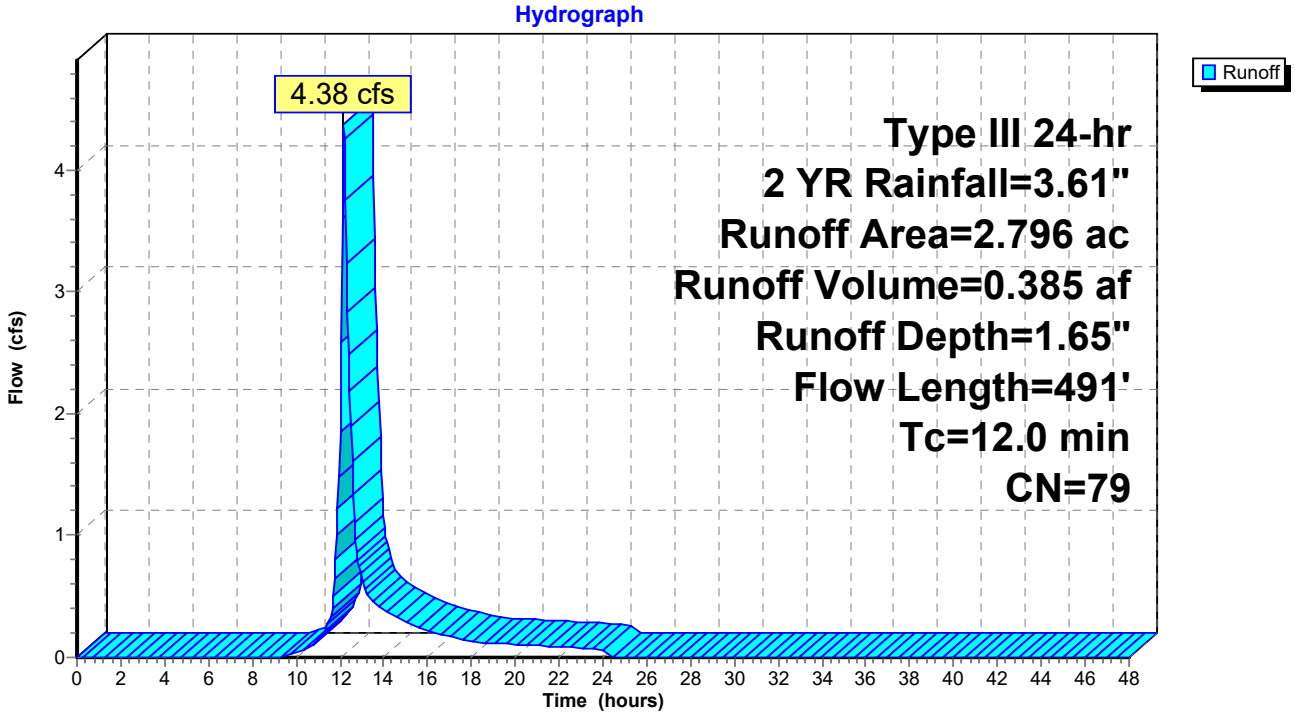
Runoff = 4.38 cfs @ 12.17 hrs, Volume= 0.385 af, Depth= 1.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.61"

Area (ac)	CN	Description
2.633	78	Meadow, non-grazed, HSG D
0.163	96	Gravel surface, HSG D
2.796	79	Weighted Average
2.796		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	100	0.0590	0.19		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.61"
3.2	376	0.0774	1.95		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.1	15	0.2800	3.70		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
12.0	491	Total			

Subcatchment PDA-2B: PDA-2B



Summary for Subcatchment PDA-2C: PDA-2C

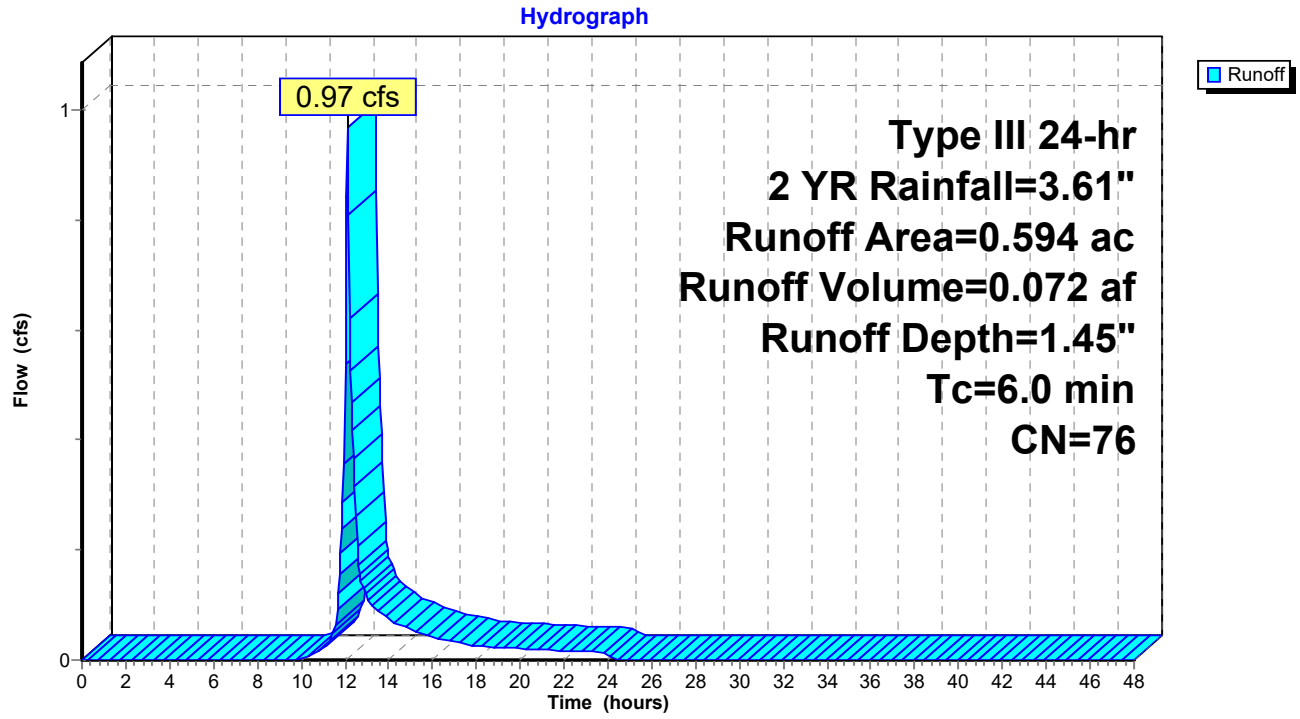
Runoff = 0.97 cfs @ 12.10 hrs, Volume= 0.072 af, Depth= 1.45"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.61"

Area (ac)	CN	Description
0.156	71	Meadow, non-grazed, HSG C
0.438	78	Meadow, non-grazed, HSG D
0.594	76	Weighted Average
0.594		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PDA-2C: PDA-2C



Summary for Subcatchment PDA-3: PDA-3

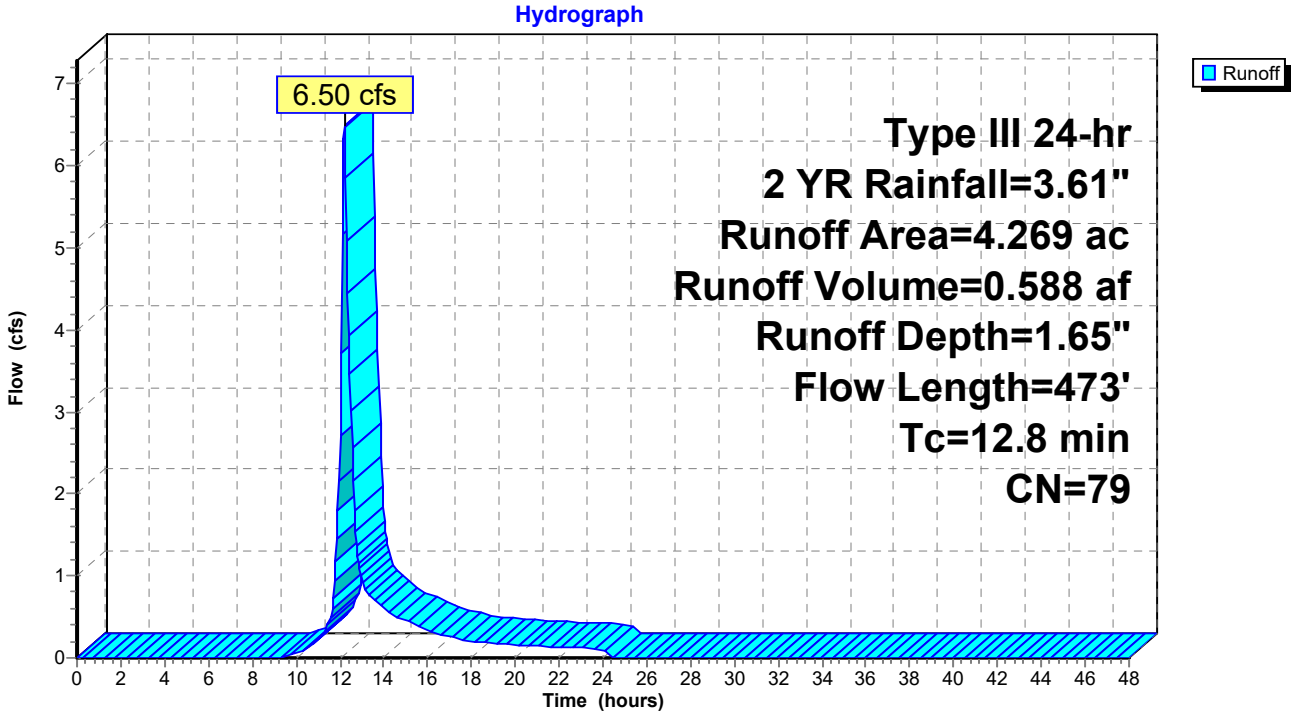
Runoff = 6.50 cfs @ 12.18 hrs, Volume= 0.588 af, Depth= 1.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 2 YR Rainfall=3.61"

Area (ac)	CN	Description
4.134	78	Meadow, non-grazed, HSG D
0.135	98	Water Surface, HSG D
4.269	79	Weighted Average
4.134		96.84% Pervious Area
0.135		3.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0503	0.18		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.61"
3.5	373	0.0628	1.75		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
12.8	473	Total			

Subcatchment PDA-3: PDA-3



Summary for Reach SW-2: SW-2

Inflow Area = 2.796 ac, 0.00% Impervious, Inflow Depth = 1.65" for 2 YR event
Inflow = 4.38 cfs @ 12.17 hrs, Volume= 0.385 af
Outflow = 4.29 cfs @ 12.20 hrs, Volume= 0.385 af, Atten= 2%, Lag= 1.8 min

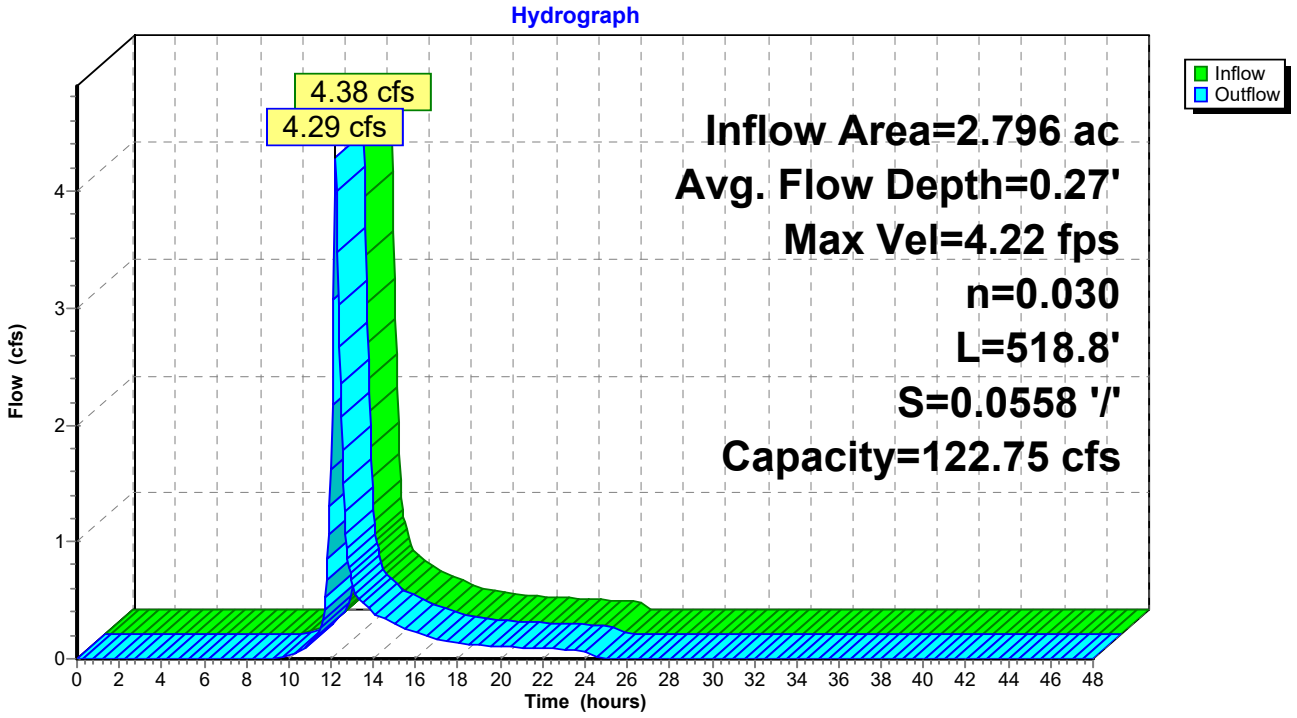
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 4.22 fps, Min. Travel Time= 2.0 min
Avg. Velocity = 1.36 fps, Avg. Travel Time= 6.4 min

Peak Storage= 528 cf @ 12.20 hrs
Average Depth at Peak Storage= 0.27'
Bank-Full Depth= 1.50' Flow Area= 11.3 sf, Capacity= 122.75 cfs

3.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 12.00'
Length= 518.8' Slope= 0.0558 '/'
Inlet Invert= 753.93', Outlet Invert= 725.00'

‡

Reach SW-2: SW-2



Summary for Pond B-1A: B-1A

Inflow Area = 3.636 ac, 0.00% Impervious, Inflow Depth = 1.51" for 2 YR event
Inflow = 4.05 cfs @ 12.33 hrs, Volume= 0.458 af
Outflow = 3.16 cfs @ 12.52 hrs, Volume= 0.458 af, Atten= 22%, Lag= 11.6 min
Primary = 3.16 cfs @ 12.52 hrs, Volume= 0.458 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 697.92' @ 12.52 hrs Surf.Area= 3,976 sf Storage= 3,329 cf

Plug-Flow detention time= 38.9 min calculated for 0.458 af (100% of inflow)
Center-of-Mass det. time= 38.1 min (899.2 - 861.1)

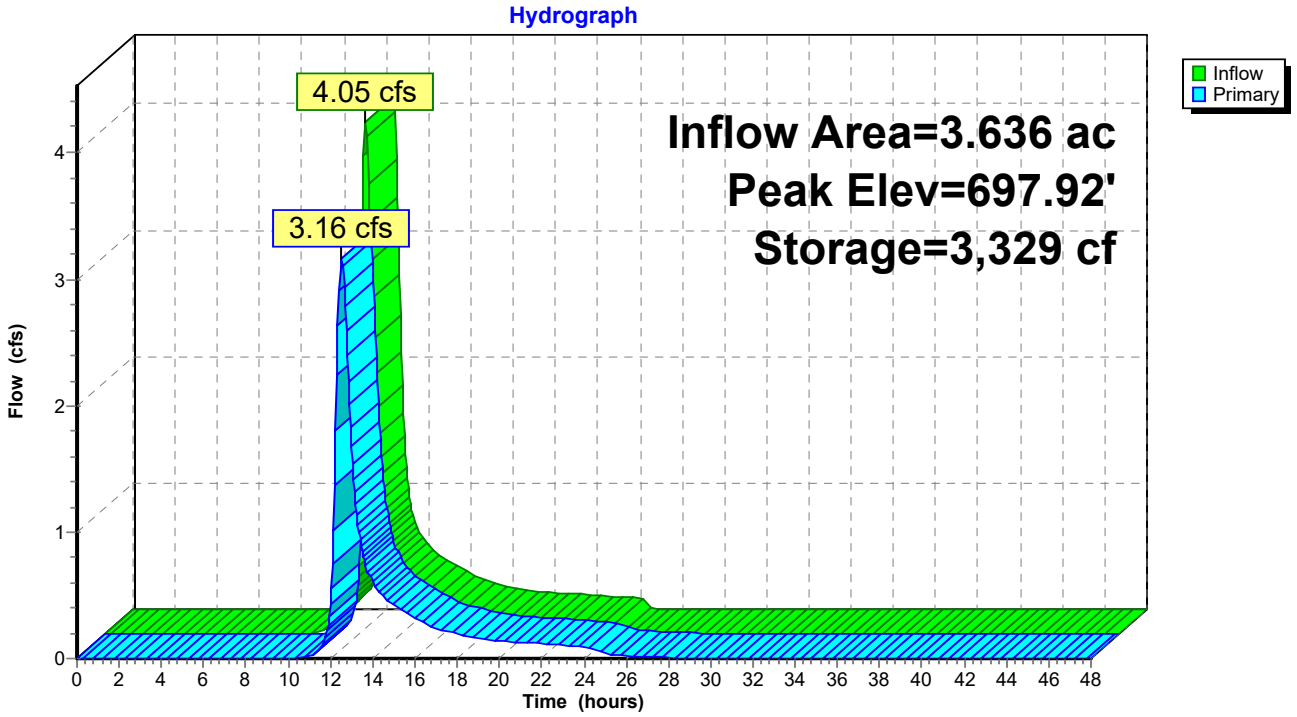
Volume	Invert	Avail.Storage	Storage Description
#1	697.00'	19,586 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
697.00	3,276	245.1	0	0	3,276
698.00	4,040	264.0	3,651	3,651	4,083
699.00	4,860	282.8	4,444	8,095	4,945
700.00	5,737	301.7	5,292	13,387	5,872
701.00	6,671	320.5	6,198	19,586	6,853

Device	Routing	Invert	Outlet Devices
#1	Primary	697.00'	**15.0" Round Culvert** L= 31.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 697.00' / 696.00' S= 0.0323 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Primary	699.50'	**7.5' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=3.15 cfs @ 12.52 hrs HW=697.92' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 3.15 cfs @ 3.26 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond B-1A: B-1A


Hydrograph
4.05 cfs
3.16 cfs
Inflow Area=3.636 ac
Peak Elev=697.92'
Storage=3,329 cf
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond B-1B: B-1B

Inflow Area = 2.472 ac, 6.88% Impervious, Inflow Depth = 1.65" for 2 YR event
Inflow = 3.10 cfs @ 12.31 hrs, Volume= 0.340 af
Outflow = 1.05 cfs @ 12.81 hrs, Volume= 0.340 af, Atten= 66%, Lag= 30.4 min
Primary = 1.05 cfs @ 12.81 hrs, Volume= 0.340 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Starting Elev= 699.40' Surf.Area= 7,385 sf Storage= 8,704 cf
Peak Elev= 700.06' @ 12.81 hrs Surf.Area= 8,682 sf Storage= 13,979 cf (5,275 cf above start)

Plug-Flow detention time= 422.9 min calculated for 0.140 af (41% of inflow)
Center-of-Mass det. time= 97.5 min (951.5 - 854.0)

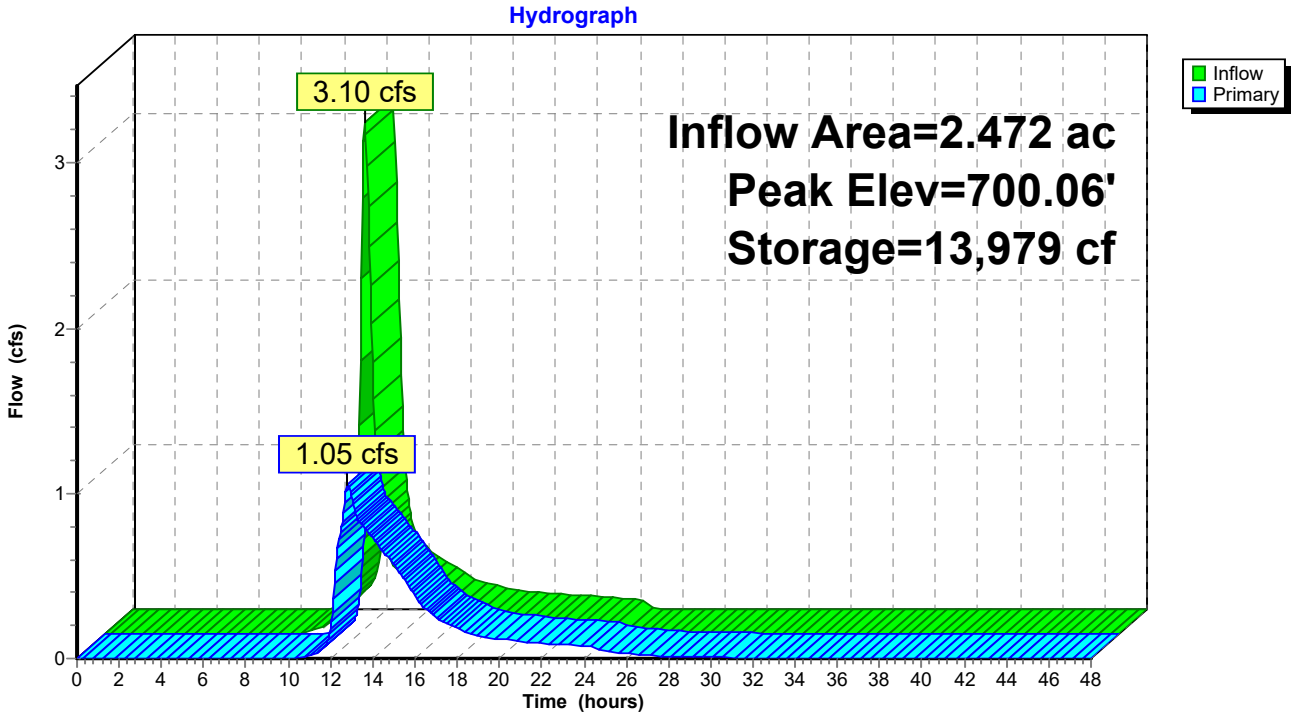
Volume	Invert	Avail.Storage	Storage Description
#1	698.00'	34,674 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
698.00	5,187	405.1	0	0	5,187
699.00	6,643	578.3	5,900	5,900	18,750
700.00	8,572	665.1	7,587	13,487	27,361
701.00	10,596	684.0	9,566	23,053	29,499
702.00	12,676	702.8	11,620	34,674	31,687

Device	Routing	Invert	Outlet Devices
#1	Primary	698.00'	**15.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 698.00' / 697.00' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	699.40'	**12.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	700.00'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	700.90'	**3.0' long x 15.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=1.05 cfs @ 12.81 hrs HW=700.06' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.05 cfs of 7.07 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.88 cfs @ 3.50 fps)
  - **3=Orifice/Grate** (Weir Controls 0.17 cfs @ 0.78 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond B-1B: B-1B


Hydrograph
3.10 cfs
1.05 cfs
Inflow Area=2.472 ac
Peak Elev=700.06'
Storage=13,979 cf
Inflow
Primary
Flow (cfs)
0
1
2
3
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48
Time (hours)

Summary for Pond B-2: B-2

Inflow Area = 6.822 ac, 4.15% Impervious, Inflow Depth = 1.65" for 2 YR event
Inflow = 9.38 cfs @ 12.23 hrs, Volume= 0.939 af
Outflow = 2.83 cfs @ 12.74 hrs, Volume= 0.938 af, Atten= 70%, Lag= 30.4 min
Primary = 2.83 cfs @ 12.74 hrs, Volume= 0.938 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Starting Elev= 721.85' Surf.Area= 12,337 sf Storage= 9,974 cf
Peak Elev= 723.06' @ 12.74 hrs Surf.Area= 14,117 sf Storage= 25,974 cf (16,000 cf above start)

Plug-Flow detention time= 302.6 min calculated for 0.708 af (75% of inflow)
Center-of-Mass det. time= 140.3 min (991.0 - 850.7)

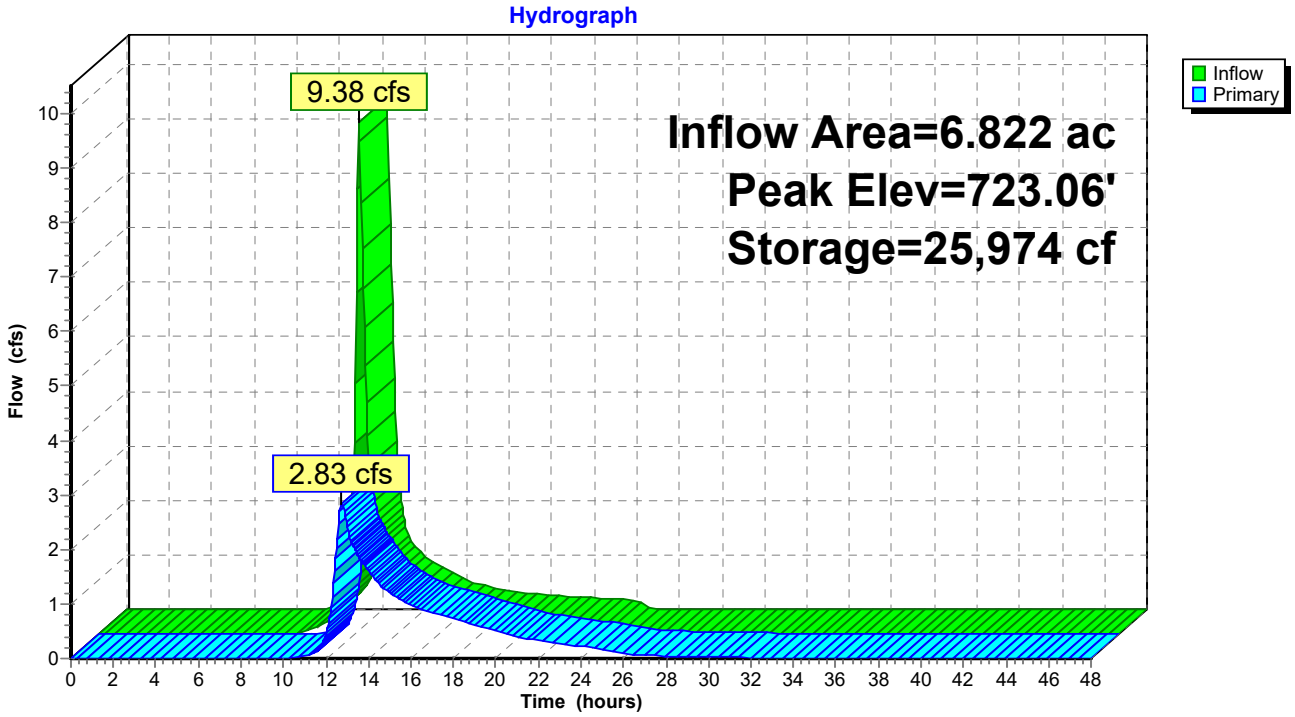
Volume	Invert	Avail.Storage	Storage Description
#1	721.00'	56,252 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
721.00	11,140	462.4	0	0	11,140
722.00	12,555	481.2	11,840	11,840	12,628
723.00	14,027	500.1	13,284	25,125	14,184
724.00	15,556	518.9	14,785	39,910	15,791
725.00	17,141	537.8	16,342	56,252	17,466

Device	Routing	Invert	Outlet Devices
#1	Primary	720.50'	**12.0" Round Culvert** L= 34.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 720.50' / 720.00' S= 0.0147 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	721.85'	**12.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	722.50'	**12.0" Vert. Orifice/Grate** C= 0.600
#4	Primary	723.00'	**11.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=2.82 cfs @ 12.74 hrs HW=723.06' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 2.41 cfs of 5.43 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 1.25 cfs @ 5.01 fps)
  - **3=Orifice/Grate** (Orifice Controls 1.15 cfs @ 2.55 fps)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 0.41 cfs @ 0.63 fps)

Pond B-2: B-2


Hydrograph
9.38 cfs
2.83 cfs
Inflow Area=6.822 ac
Peak Elev=723.06'
Storage=25,974 cf
Inflow
Primary
Flow (cfs)
Time (hours)
0 1 2 3 4 5 6 7 8 9 10
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond B-3: B-3

Inflow Area = 4.269 ac, 3.16% Impervious, Inflow Depth = 1.65" for 2 YR event
Inflow = 6.50 cfs @ 12.18 hrs, Volume= 0.588 af
Outflow = 3.77 cfs @ 12.42 hrs, Volume= 0.587 af, Atten= 42%, Lag= 14.0 min
Primary = 3.77 cfs @ 12.42 hrs, Volume= 0.587 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Starting Elev= 736.05' Surf.Area= 5,881 sf Storage= 5,653 cf
Peak Elev= 737.00' @ 12.42 hrs Surf.Area= 6,823 sf Storage= 11,686 cf (6,034 cf above start)

Plug-Flow detention time= 187.3 min calculated for 0.458 af (78% of inflow)
Center-of-Mass det. time= 54.7 min (900.8 - 846.1)

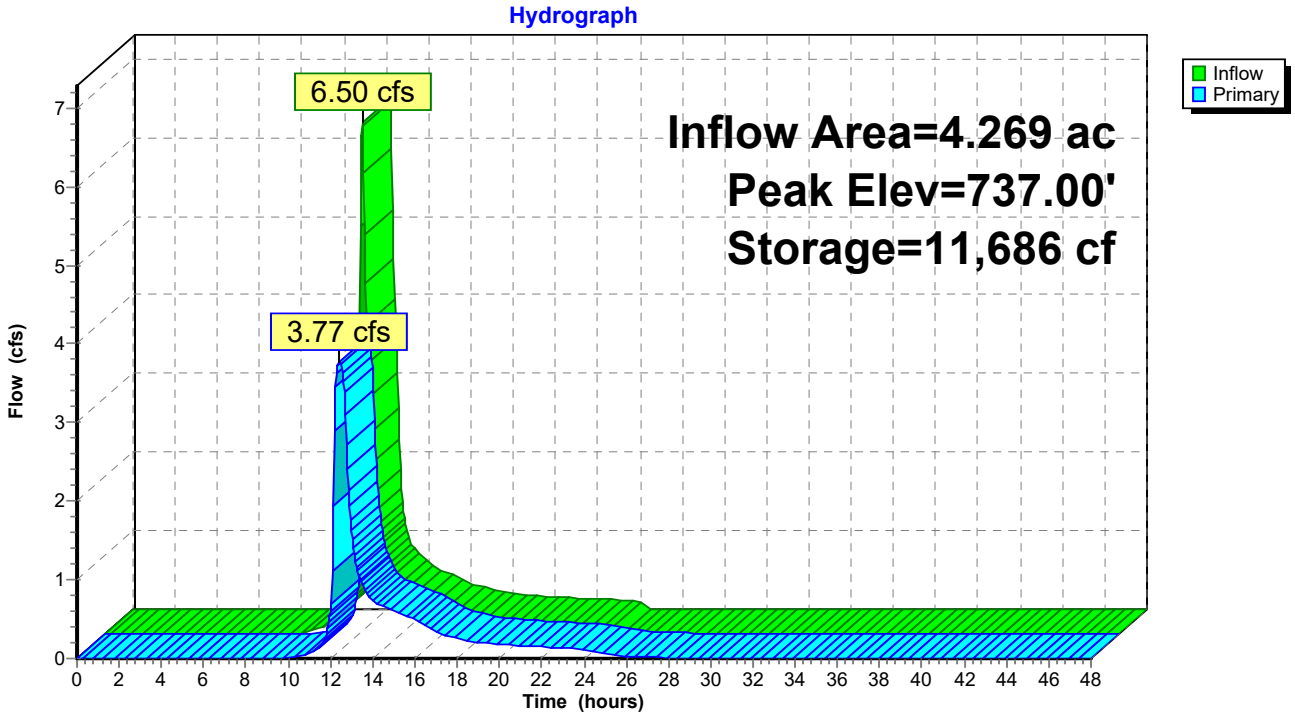
Volume	Invert	Avail.Storage	Storage Description
#1	735.00'	27,433 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
735.00	4,900	301.5	0	0	4,900
736.00	5,833	320.3	5,360	5,360	5,881
737.00	6,822	339.2	6,321	11,681	6,926
738.00	7,868	358.0	7,339	19,020	8,026
739.00	8,971	376.9	8,413	27,433	9,191

Device	Routing	Invert	Outlet Devices
#1	Primary	735.50'	**12.0" Round Culvert** L= 28.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 735.50' / 735.00' S= 0.0179 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	736.05'	**12.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	736.50'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	737.00'	**8.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=3.76 cfs @ 12.42 hrs HW=737.00' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 2.67 cfs of 3.78 cfs potential flow)
  - **3=Orifice/Grate** (Orifice Controls 2.67 cfs @ 3.40 fps)
- **2=Orifice/Grate** (Orifice Controls 1.09 cfs @ 4.37 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond B-3: B-3

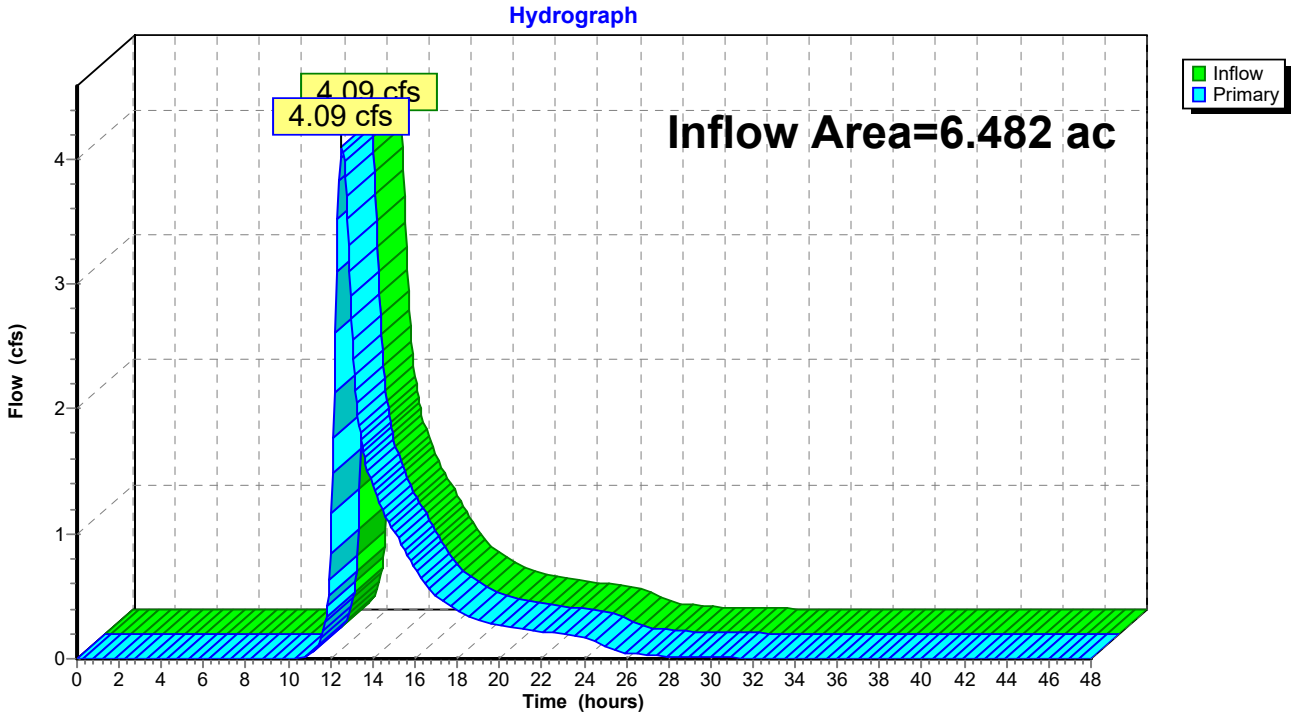

Hydrograph
6.50 cfs
3.77 cfs
Inflow Area=4.269 ac
Peak Elev=737.00'
Storage=11,686 cf
Inflow
Primary
Flow (cfs)
Time (hours)
0
1
2
3
4
5
6
7
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Link AP-1: AP-1

Inflow Area = 6.482 ac, 2.62% Impervious, Inflow Depth > 1.54" for 2 YR event
Inflow = 4.09 cfs @ 12.52 hrs, Volume= 0.833 af
Primary = 4.09 cfs @ 12.52 hrs, Volume= 0.833 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link AP-1: AP-1

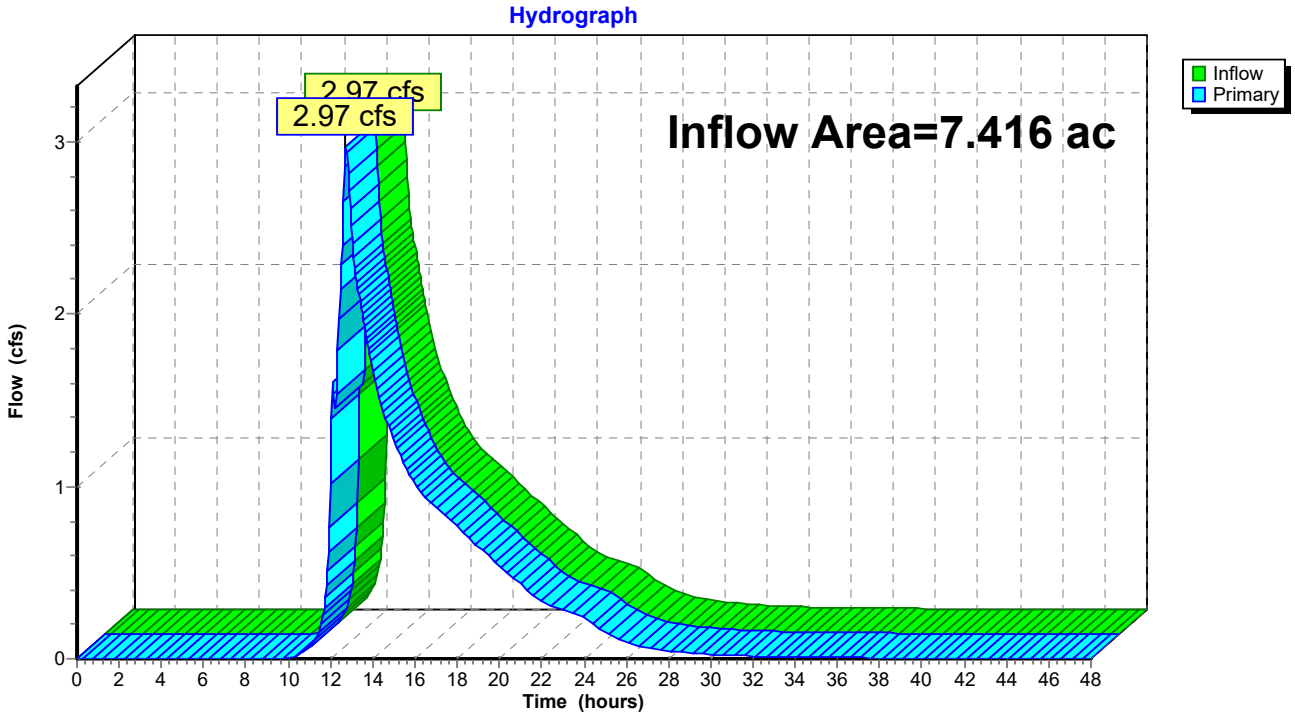


Summary for Link AP-2: AP-2

Inflow Area = 7.416 ac, 3.82% Impervious, Inflow Depth > 1.63" for 2 YR event
Inflow = 2.97 cfs @ 12.73 hrs, Volume= 1.009 af
Primary = 2.97 cfs @ 12.73 hrs, Volume= 1.009 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link AP-2: AP-2

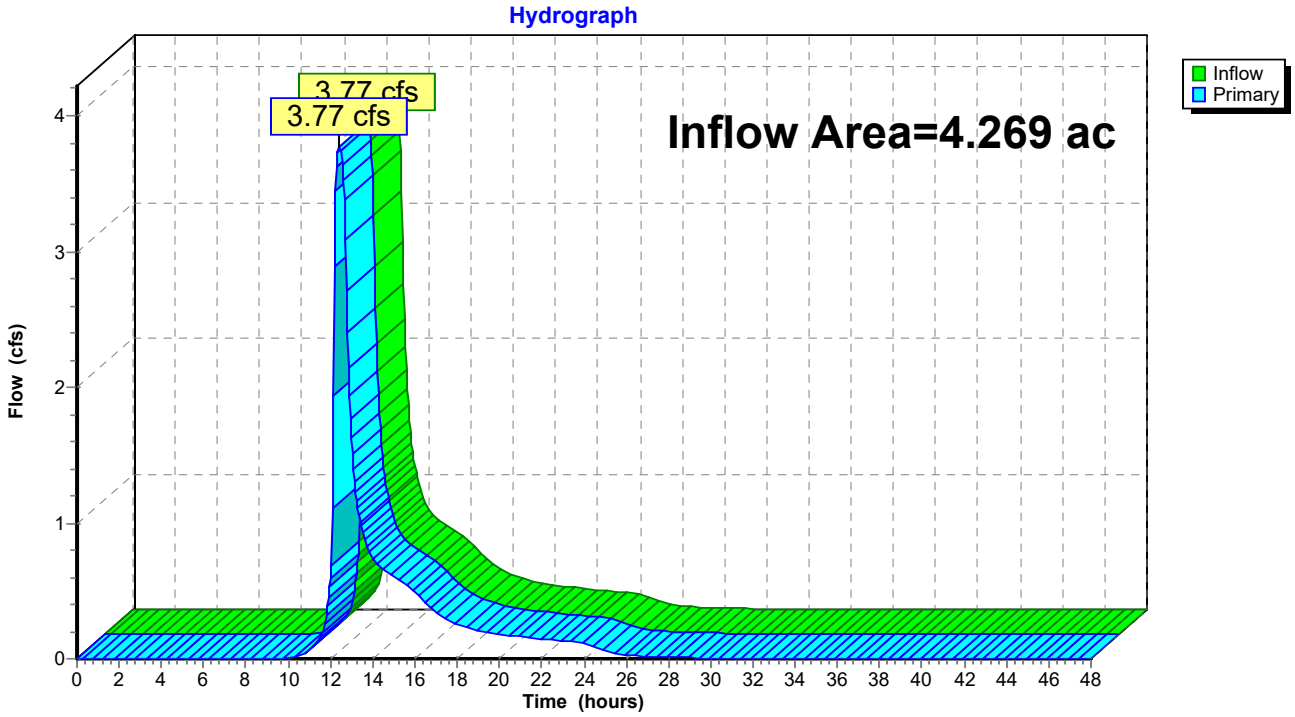


Summary for Link AP-3: AP-3

Inflow Area = 4.269 ac, 3.16% Impervious, Inflow Depth = 1.65" for 2 YR event
Inflow = 3.77 cfs @ 12.42 hrs, Volume= 0.587 af
Primary = 3.77 cfs @ 12.42 hrs, Volume= 0.587 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link AP-3: AP-3



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PDA-1A: PDA-1A Runoff Area=3.636 ac 0.00% Impervious Runoff Depth=4.48"
Flow Length=552' Tc=22.5 min CN=77 Runoff=12.22 cfs 1.358 af

Subcatchment PDA-1B: PDA-1B Runoff Area=2.472 ac 6.88% Impervious Runoff Depth=4.70"
Flow Length=357' Tc=21.4 min CN=79 Runoff=8.86 cfs 0.969 af

Subcatchment PDA-1C: PDA-1C Runoff Area=0.374 ac 0.00% Impervious Runoff Depth=3.83"
Tc=6.0 min CN=71 Runoff=1.65 cfs 0.119 af

Subcatchment PDA-2A: PDA-2A Runoff Area=4.026 ac 7.03% Impervious Runoff Depth=4.70"
Flow Length=278' Tc=18.6 min CN=79 Runoff=15.30 cfs 1.578 af

Subcatchment PDA-2B: PDA-2B Runoff Area=2.796 ac 0.00% Impervious Runoff Depth=4.70"
Flow Length=491' Tc=12.0 min CN=79 Runoff=12.51 cfs 1.096 af

Subcatchment PDA-2C: PDA-2C Runoff Area=0.594 ac 0.00% Impervious Runoff Depth=4.37"
Tc=6.0 min CN=76 Runoff=2.98 cfs 0.216 af

Subcatchment PDA-3: PDA-3 Runoff Area=4.269 ac 3.16% Impervious Runoff Depth=4.70"
Flow Length=473' Tc=12.8 min CN=79 Runoff=18.67 cfs 1.673 af

Reach SW-2: SW-2 Avg. Flow Depth=0.48' Max Vel=5.82 fps Inflow=12.51 cfs 1.096 af
n=0.030 L=518.8' S=0.0558 '/' Capacity=122.75 cfs Outflow=12.32 cfs 1.096 af

Pond B-1A: B-1A Peak Elev=699.42' Storage=10,198 cf Inflow=12.22 cfs 1.358 af
Outflow=7.91 cfs 1.358 af

Pond B-1B: B-1B Peak Elev=700.61' Storage=19,090 cf Inflow=8.86 cfs 0.969 af
Outflow=5.87 cfs 0.969 af

Pond B-2: B-2 Peak Elev=723.71' Storage=35,527 cf Inflow=26.99 cfs 2.674 af
Outflow=22.59 cfs 2.672 af

Pond B-3: B-3 Peak Elev=737.63' Storage=16,216 cf Inflow=18.67 cfs 1.673 af
Outflow=16.38 cfs 1.673 af

Link AP-1: AP-1 Inflow=14.12 cfs 2.446 af
Primary=14.12 cfs 2.446 af

Link AP-2: AP-2 Inflow=23.80 cfs 2.889 af
Primary=23.80 cfs 2.889 af

Link AP-3: AP-3 Inflow=16.38 cfs 1.673 af
Primary=16.38 cfs 1.673 af

Total Runoff Area = 18.167 ac Runoff Volume = 7.010 af Average Runoff Depth = 4.63"
96.76% Pervious = 17.579 ac 3.24% Impervious = 0.588 ac

Summary for Subcatchment PDA-1A: PDA-1A

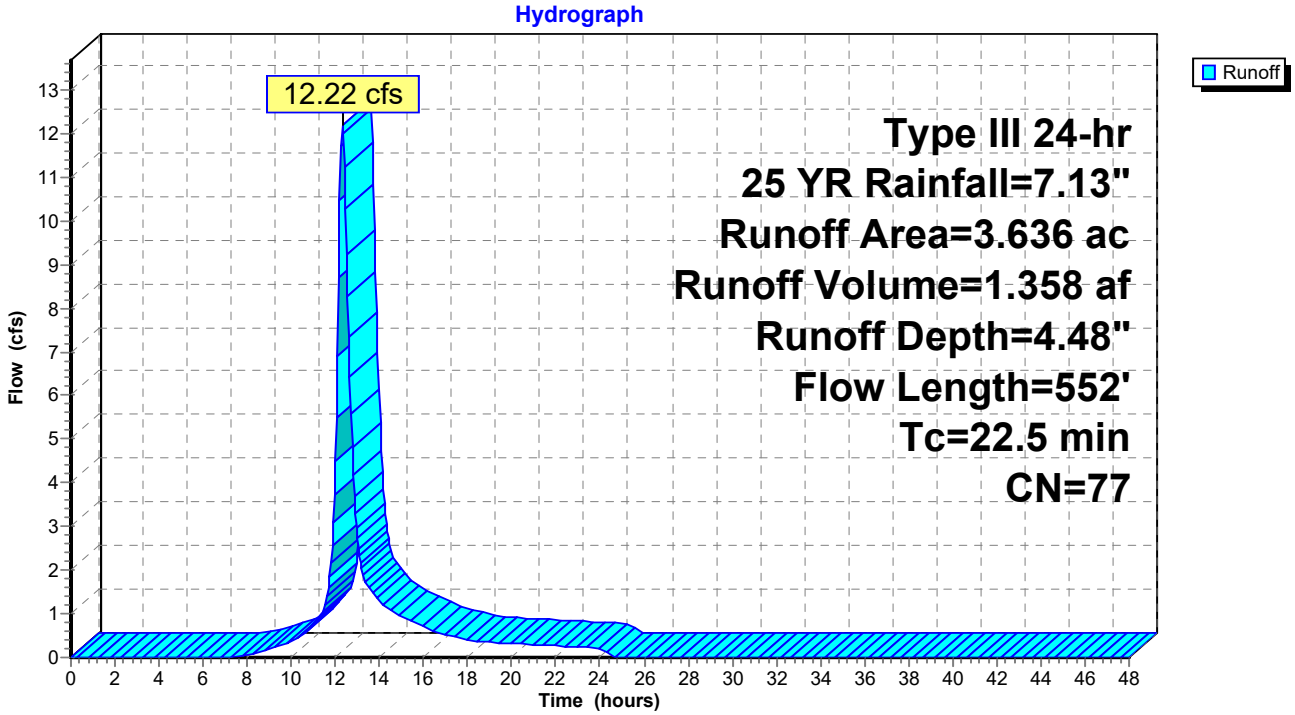
Runoff = 12.22 cfs @ 12.31 hrs, Volume= 1.358 af, Depth= 4.48"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=7.13"

Area (ac)	CN	Description
0.308	71	Meadow, non-grazed, HSG C
3.328	78	Meadow, non-grazed, HSG D
3.636	77	Weighted Average
3.636		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0104	0.10		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.61"
3.1	203	0.0238	1.08		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.6	181	0.0761	1.93		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
0.3	68	0.3333	4.04		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
22.5	552	Total			

Subcatchment PDA-1A: PDA-1A



Summary for Subcatchment PDA-1B: PDA-1B

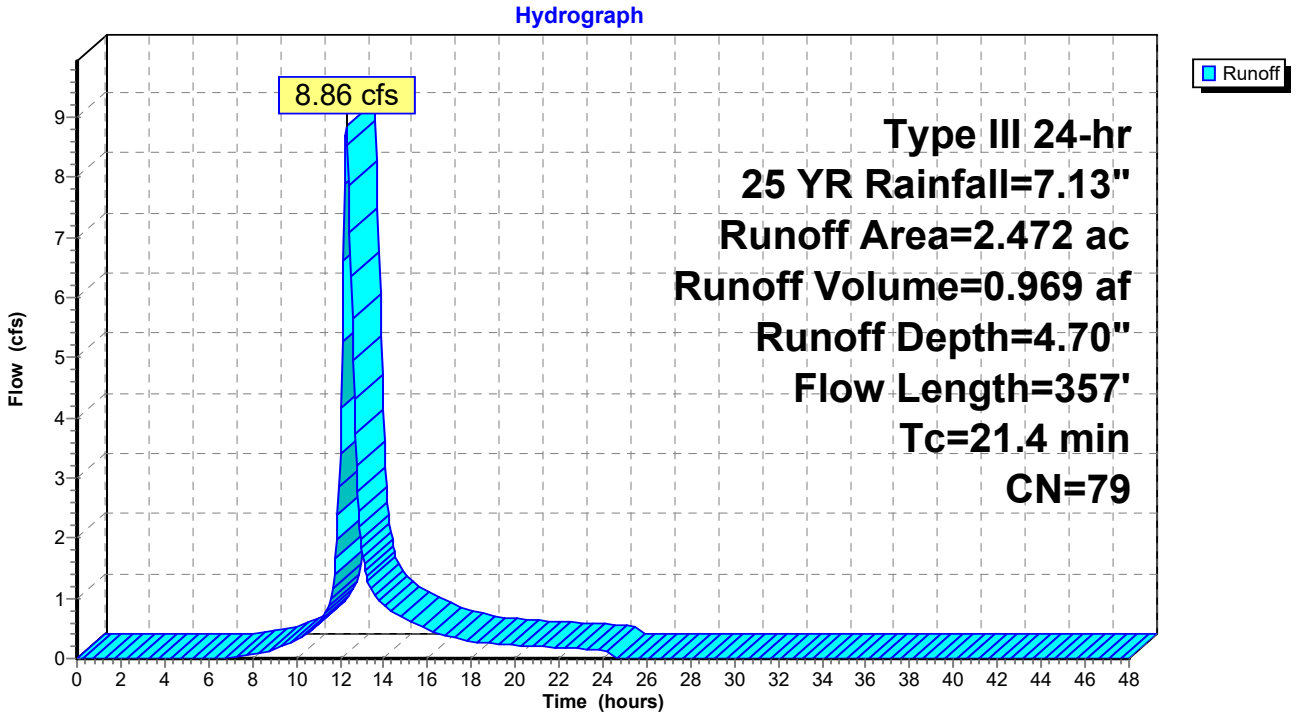
Runoff = 8.86 cfs @ 12.29 hrs, Volume= 0.969 af, Depth= 4.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=7.13"

Area (ac)	CN	Description
0.014	71	Meadow, non-grazed, HSG C
2.288	78	Meadow, non-grazed, HSG D
0.170	98	Water Surface, HSG D
2.472	79	Weighted Average
2.302		93.12% Pervious Area
0.170		6.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.4	100	0.0070	0.08		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.61"
0.5	36	0.0338	1.29		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.3	162	0.0500	10.58	118.47	**Channel Flow, D-E** Area= 11.2 sf Perim= 12.0' r= 0.93' n= 0.030 Earth, grassed & winding
0.2	59	0.3333	4.04		**Shallow Concentrated Flow, E-F** Short Grass Pasture Kv= 7.0 fps
21.4	357	Total			

Subcatchment PDA-1B: PDA-1B



Summary for Subcatchment PDA-1C: PDA-1C

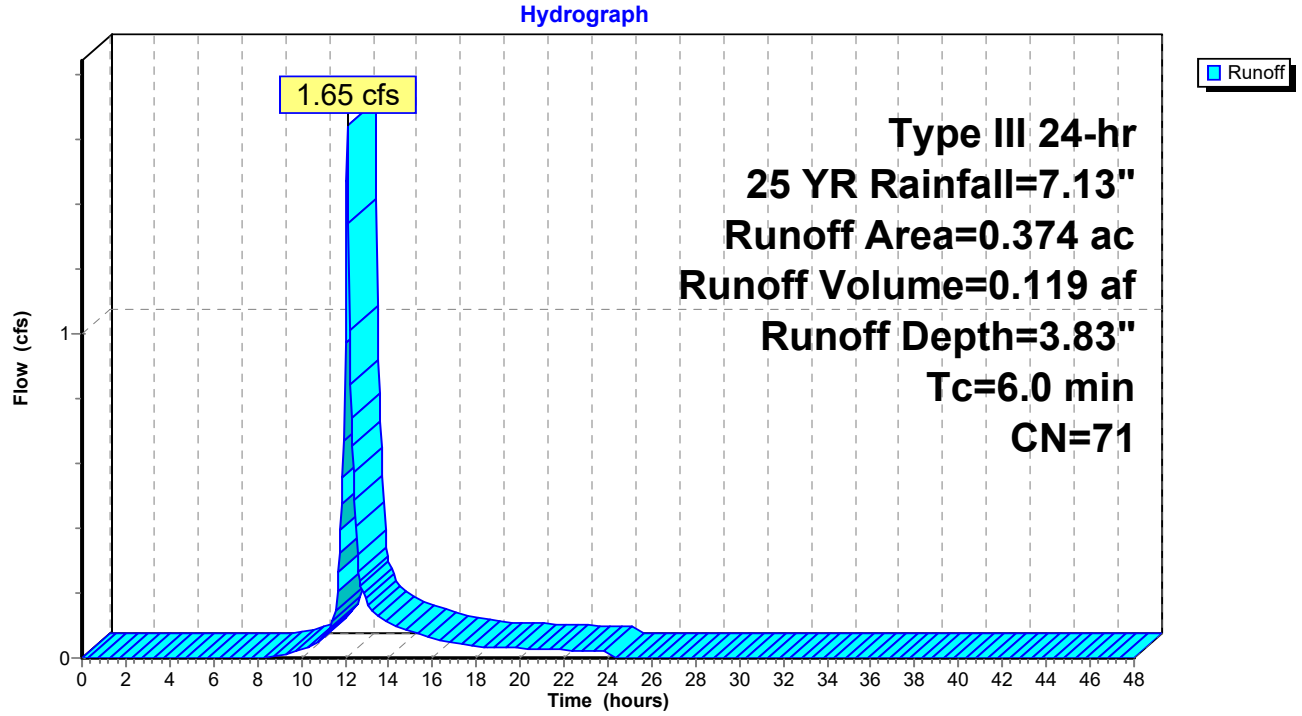
Runoff = 1.65 cfs @ 12.09 hrs, Volume= 0.119 af, Depth= 3.83"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=7.13"

Area (ac)	CN	Description
0.374	71	Meadow, non-grazed, HSG C
0.374		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PDA-1C: PDA-1C



Summary for Subcatchment PDA-2A: PDA-2A

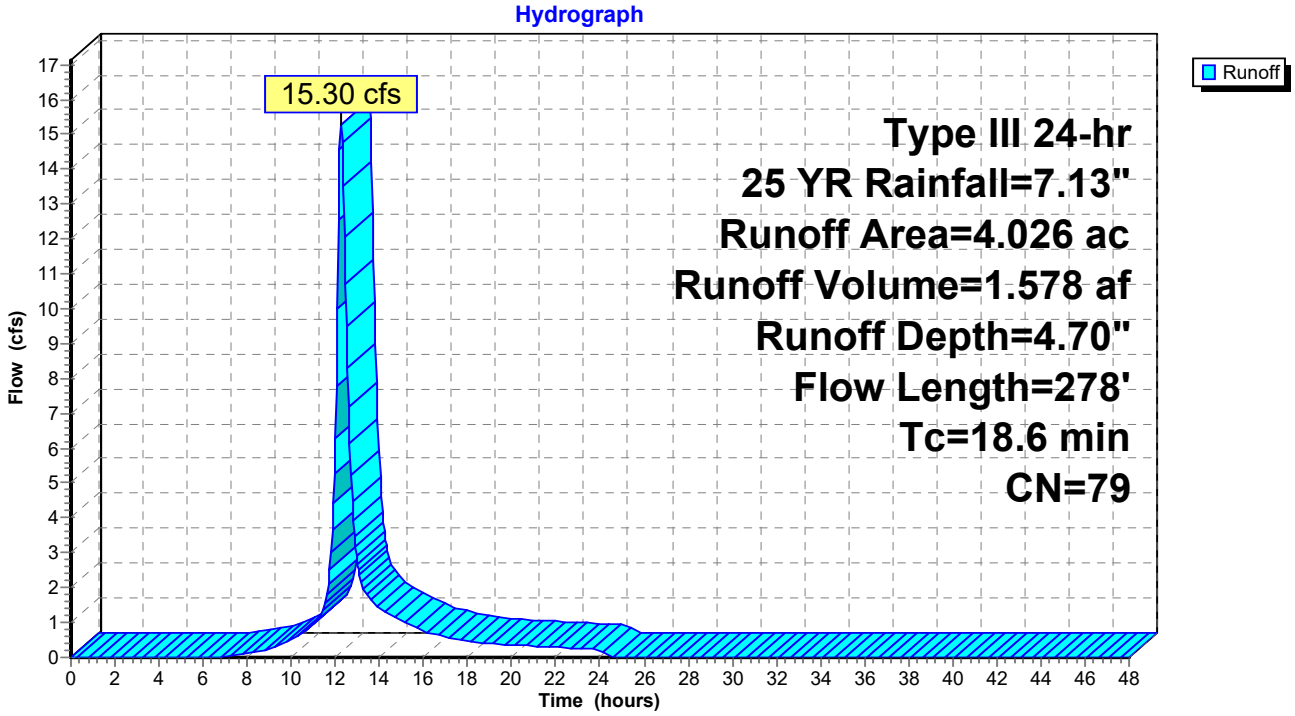
Runoff = 15.30 cfs @ 12.25 hrs, Volume= 1.578 af, Depth= 4.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=7.13"

Area (ac)	CN	Description
3.742	78	Meadow, non-grazed, HSG D
0.001	96	Gravel surface, HSG D
0.283	98	Water Surface, HSG D
4.026	79	Weighted Average
3.743		92.97% Pervious Area
0.283		7.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6	100	0.0118	0.10		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.61"
2.0	178	0.0428	1.45		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
18.6	278	Total			

Subcatchment PDA-2A: PDA-2A



Summary for Subcatchment PDA-2B: PDA-2B

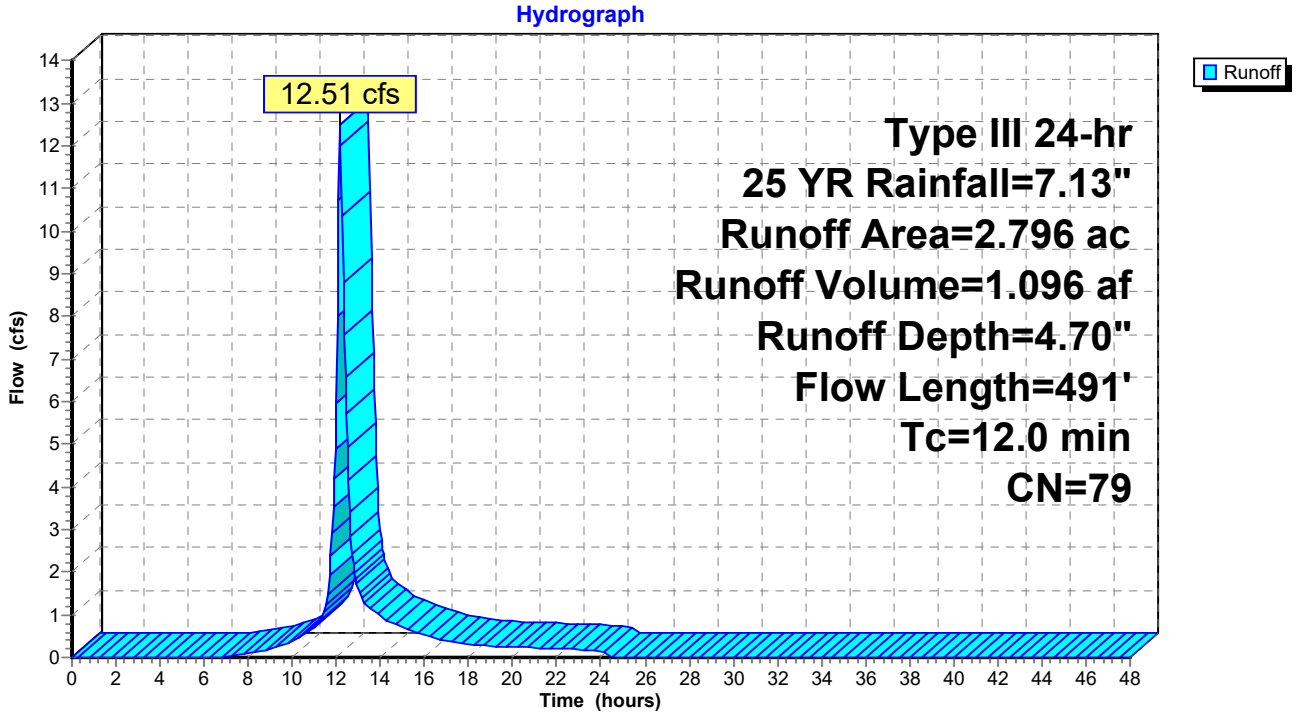
Runoff = 12.51 cfs @ 12.17 hrs, Volume= 1.096 af, Depth= 4.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=7.13"

Area (ac)	CN	Description
2.633	78	Meadow, non-grazed, HSG D
0.163	96	Gravel surface, HSG D
2.796	79	Weighted Average
2.796		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	100	0.0590	0.19		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.61"
3.2	376	0.0774	1.95		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.1	15	0.2800	3.70		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
12.0	491	Total			

Subcatchment PDA-2B: PDA-2B



Summary for Subcatchment PDA-2C: PDA-2C

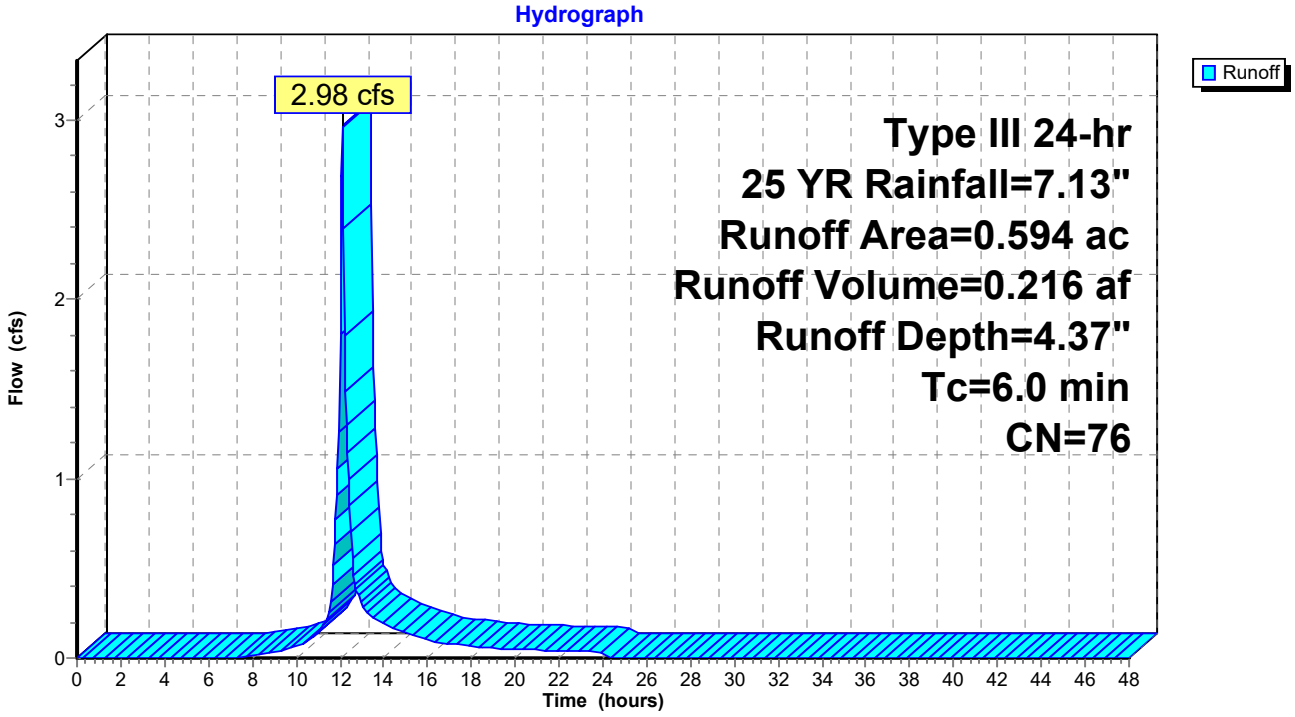
Runoff = 2.98 cfs @ 12.09 hrs, Volume= 0.216 af, Depth= 4.37"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=7.13"

Area (ac)	CN	Description
0.156	71	Meadow, non-grazed, HSG C
0.438	78	Meadow, non-grazed, HSG D
0.594	76	Weighted Average
0.594		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PDA-2C: PDA-2C



Summary for Subcatchment PDA-3: PDA-3

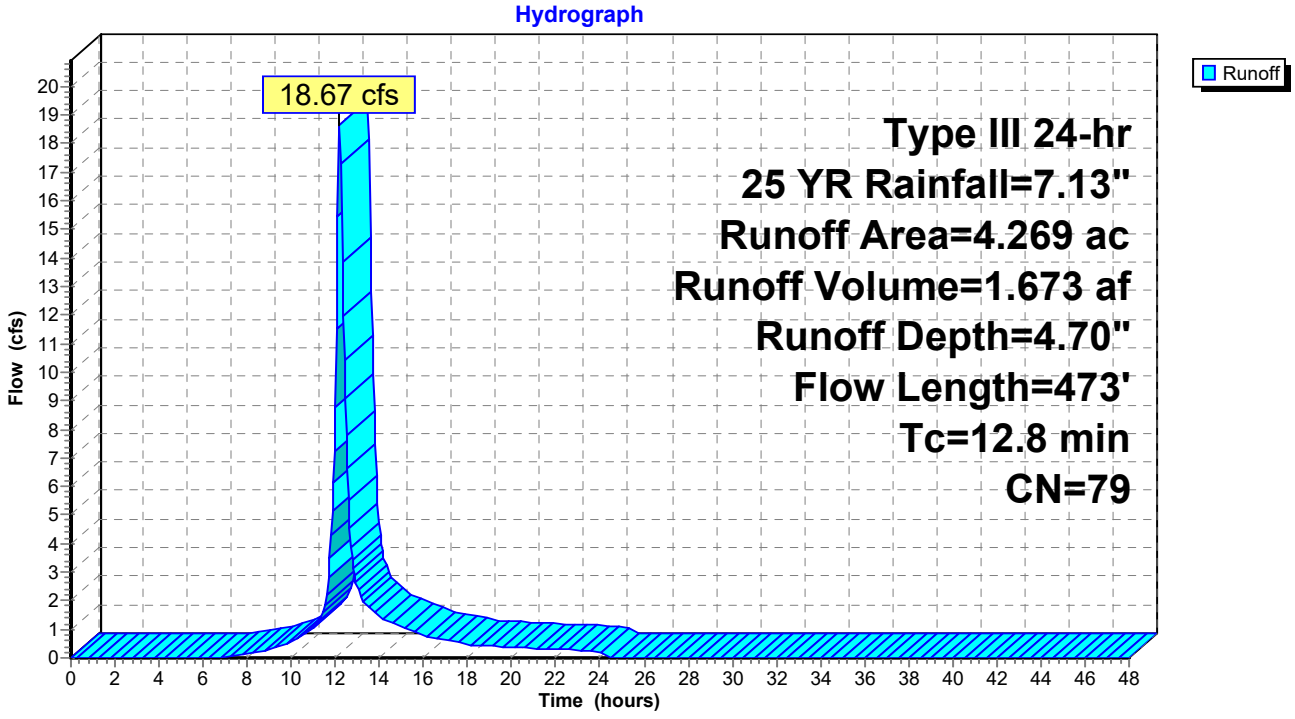
Runoff = 18.67 cfs @ 12.17 hrs, Volume= 1.673 af, Depth= 4.70"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 25 YR Rainfall=7.13"

Area (ac)	CN	Description
4.134	78	Meadow, non-grazed, HSG D
0.135	98	Water Surface, HSG D
4.269	79	Weighted Average
4.134		96.84% Pervious Area
0.135		3.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0503	0.18		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.61"
3.5	373	0.0628	1.75		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
12.8	473	Total			

Subcatchment PDA-3: PDA-3



Summary for Reach SW-2: SW-2

Inflow Area = 2.796 ac, 0.00% Impervious, Inflow Depth = 4.70" for 25 YR event
Inflow = 12.51 cfs @ 12.17 hrs, Volume= 1.096 af
Outflow = 12.32 cfs @ 12.19 hrs, Volume= 1.096 af, Atten= 2%, Lag= 1.3 min

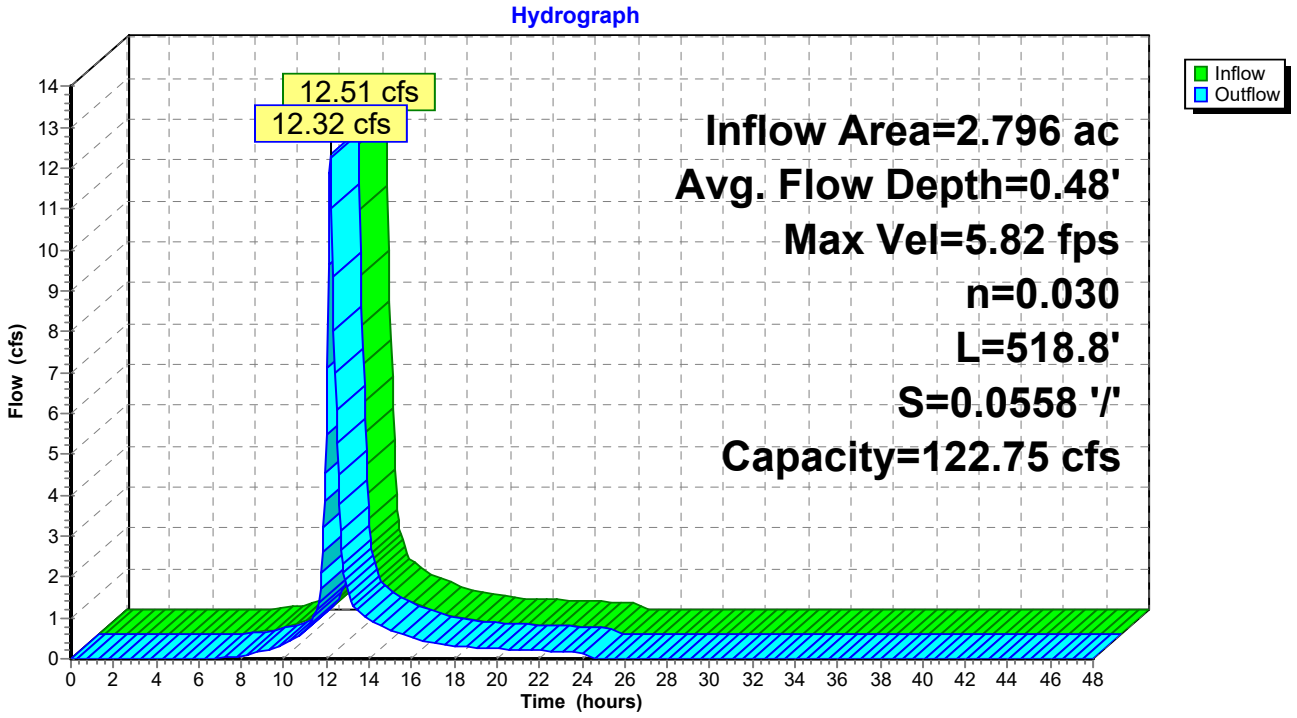
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 5.82 fps, Min. Travel Time= 1.5 min
Avg. Velocity = 1.80 fps, Avg. Travel Time= 4.8 min

Peak Storage= 1,097 cf @ 12.19 hrs
Average Depth at Peak Storage= 0.48'
Bank-Full Depth= 1.50' Flow Area= 11.3 sf, Capacity= 122.75 cfs

3.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 12.00'
Length= 518.8' Slope= 0.0558 '/'
Inlet Invert= 753.93', Outlet Invert= 725.00'

‡

Reach SW-2: SW-2



Summary for Pond B-1A: B-1A

Inflow Area = 3.636 ac, 0.00% Impervious, Inflow Depth = 4.48" for 25 YR event
Inflow = 12.22 cfs @ 12.31 hrs, Volume= 1.358 af
Outflow = 7.91 cfs @ 12.57 hrs, Volume= 1.358 af, Atten= 35%, Lag= 15.7 min
Primary = 7.91 cfs @ 12.57 hrs, Volume= 1.358 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 699.42' @ 12.57 hrs Surf.Area= 5,217 sf Storage= 10,198 cf

Plug-Flow detention time= 27.6 min calculated for 1.358 af (100% of inflow)
Center-of-Mass det. time= 27.2 min (856.8 - 829.7)

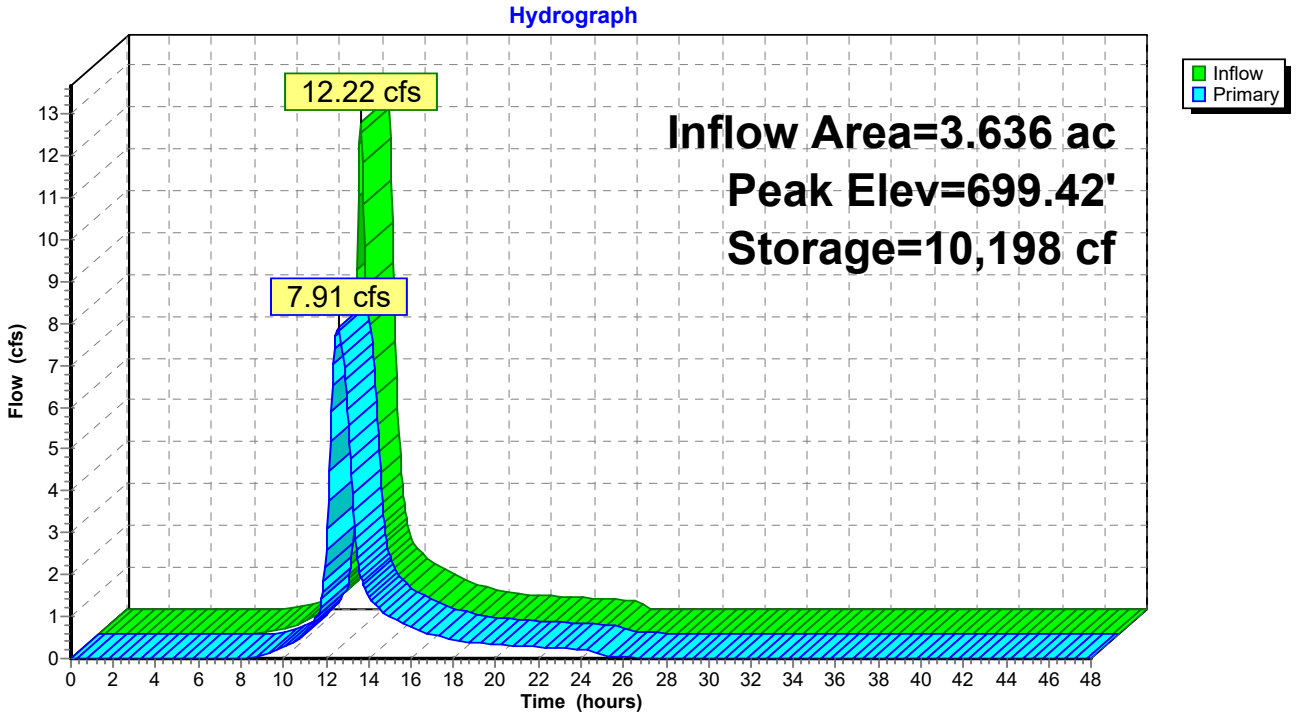
Volume	Invert	Avail.Storage	Storage Description
#1	697.00'	19,586 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
697.00	3,276	245.1	0	0	3,276
698.00	4,040	264.0	3,651	3,651	4,083
699.00	4,860	282.8	4,444	8,095	4,945
700.00	5,737	301.7	5,292	13,387	5,872
701.00	6,671	320.5	6,198	19,586	6,853

Device	Routing	Invert	Outlet Devices
#1	Primary	697.00'	**15.0" Round Culvert** L= 31.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 697.00' / 696.00' S= 0.0323 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Primary	699.50'	**7.5' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=7.90 cfs @ 12.57 hrs HW=699.41' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 7.90 cfs @ 6.44 fps)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond B-1A: B-1A


Hydrograph
12.22 cfs
7.91 cfs
Inflow Area=3.636 ac
Peak Elev=699.42'
Storage=10,198 cf
Inflow
Primary
Flow (cfs)
Time (hours)
0 1 2 3 4 5 6 7 8 9 10 11 12 13
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond B-1B: B-1B

Inflow Area = 2.472 ac, 6.88% Impervious, Inflow Depth = 4.70" for 25 YR event
Inflow = 8.86 cfs @ 12.29 hrs, Volume= 0.969 af
Outflow = 5.87 cfs @ 12.53 hrs, Volume= 0.969 af, Atten= 34%, Lag= 14.5 min
Primary = 5.87 cfs @ 12.53 hrs, Volume= 0.969 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Starting Elev= 699.40' Surf.Area= 7,385 sf Storage= 8,704 cf
Peak Elev= 700.61' @ 12.53 hrs Surf.Area= 9,783 sf Storage= 19,090 cf (10,386 cf above start)

Plug-Flow detention time= 188.2 min calculated for 0.768 af (79% of inflow)
Center-of-Mass det. time= 65.4 min (889.3 - 824.0)

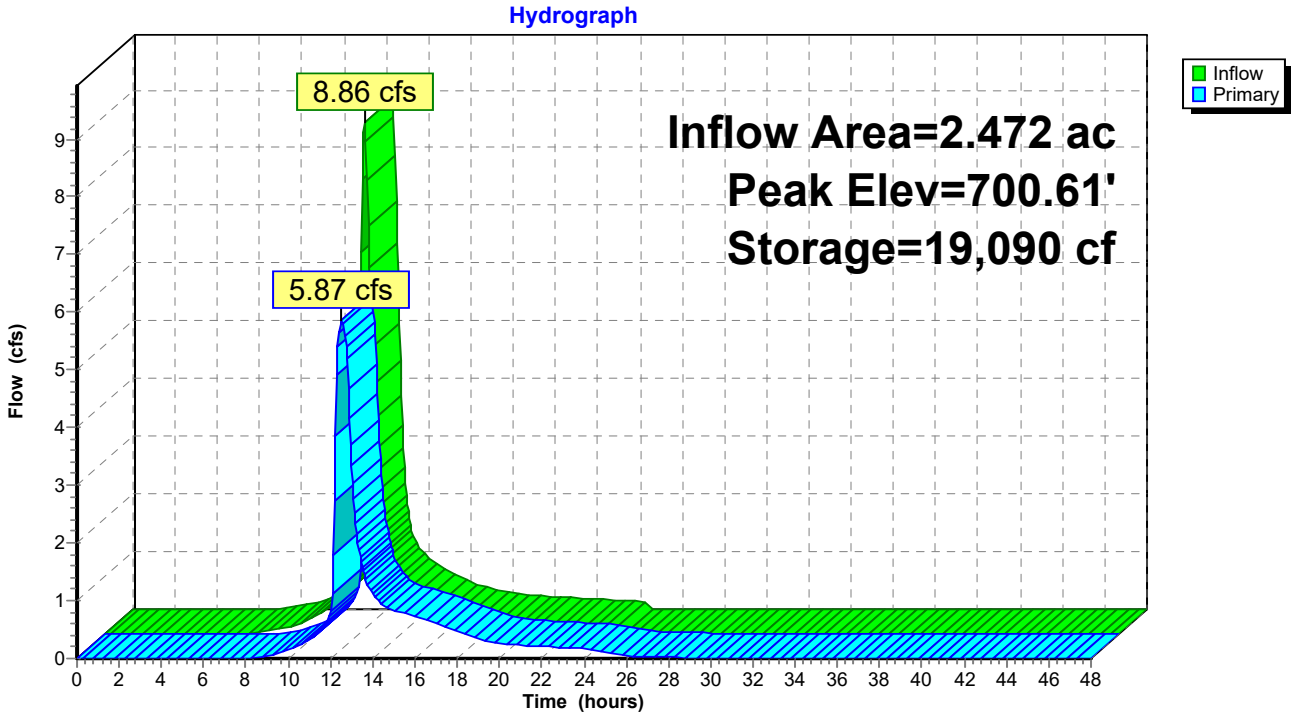
Volume	Invert	Avail.Storage	Storage Description
#1	698.00'	34,674 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
698.00	5,187	405.1	0	0	5,187
699.00	6,643	578.3	5,900	5,900	18,750
700.00	8,572	665.1	7,587	13,487	27,361
701.00	10,596	684.0	9,566	23,053	29,499
702.00	12,676	702.8	11,620	34,674	31,687

Device	Routing	Invert	Outlet Devices
#1	Primary	698.00'	**15.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 698.00' / 697.00' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	699.40'	**12.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	700.00'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	700.90'	**3.0' long x 15.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=5.87 cfs @ 12.53 hrs HW=700.61' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 5.87 cfs of 8.32 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 1.25 cfs @ 5.01 fps)
  - **3=Orifice/Grate** (Orifice Controls 4.61 cfs @ 3.76 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond B-1B: B-1B


Hydrograph
8.86 cfs
5.87 cfs
Inflow Area=2.472 ac
Peak Elev=700.61'
Storage=19,090 cf
Inflow
Primary
Flow (cfs)
Time (hours)
0 1 2 3 4 5 6 7 8 9
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond B-2: B-2

Inflow Area = 6.822 ac, 4.15% Impervious, Inflow Depth = 4.70" for 25 YR event
Inflow = 26.99 cfs @ 12.22 hrs, Volume= 2.674 af
Outflow = 22.59 cfs @ 12.33 hrs, Volume= 2.672 af, Atten= 16%, Lag= 7.1 min
Primary = 22.59 cfs @ 12.33 hrs, Volume= 2.672 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Starting Elev= 721.85' Surf.Area= 12,337 sf Storage= 9,974 cf
Peak Elev= 723.71' @ 12.33 hrs Surf.Area= 15,111 sf Storage= 35,527 cf (25,554 cf above start)

Plug-Flow detention time= 148.9 min calculated for 2.441 af (91% of inflow)
Center-of-Mass det. time= 85.4 min (905.6 - 820.1)

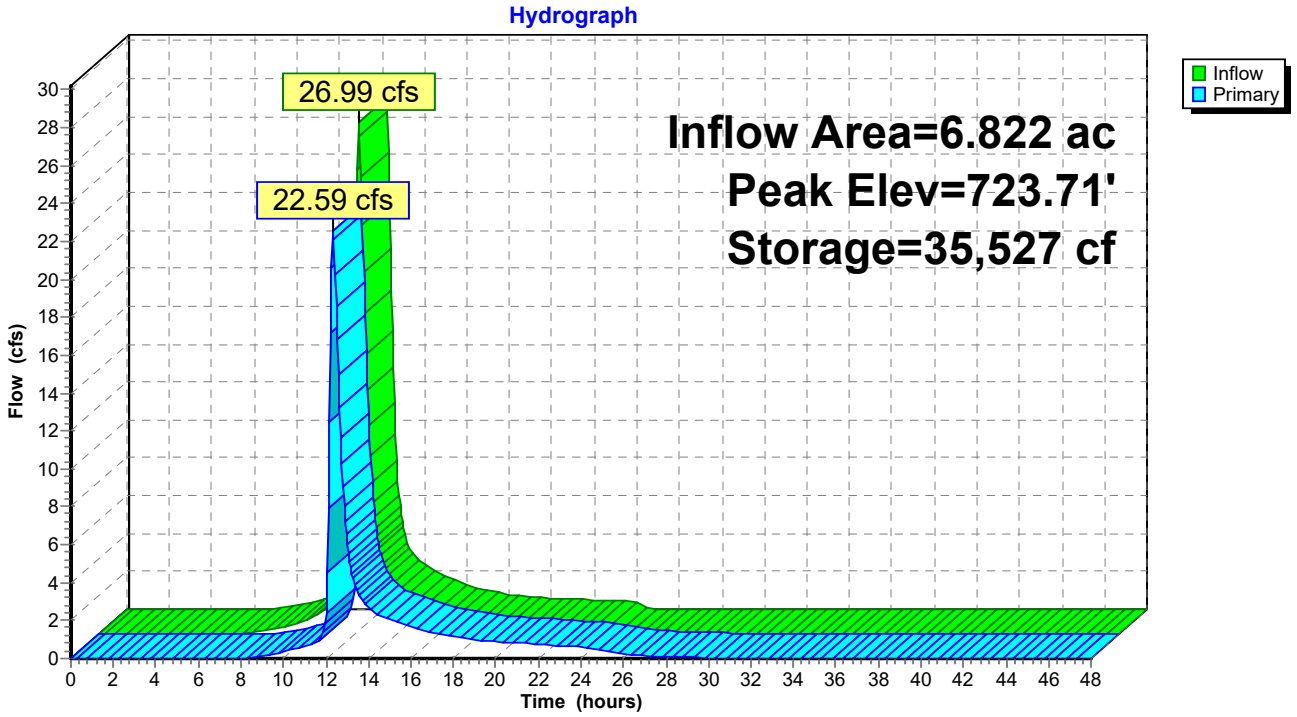
Volume	Invert	Avail.Storage	Storage Description
#1	721.00'	56,252 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
721.00	11,140	462.4	0	0	11,140
722.00	12,555	481.2	11,840	11,840	12,628
723.00	14,027	500.1	13,284	25,125	14,184
724.00	15,556	518.9	14,785	39,910	15,791
725.00	17,141	537.8	16,342	56,252	17,466

Device	Routing	Invert	Outlet Devices
#1	Primary	720.50'	**12.0" Round Culvert** L= 34.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 720.50' / 720.00' S= 0.0147 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	721.85'	**12.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	722.50'	**12.0" Vert. Orifice/Grate** C= 0.600
#4	Primary	723.00'	**11.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=22.48 cfs @ 12.33 hrs HW=723.71' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 4.78 cfs of 6.23 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 1.59 cfs @ 6.34 fps)
  - **3=Orifice/Grate** (Orifice Controls 3.19 cfs @ 4.06 fps)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 17.71 cfs @ 2.26 fps)

Pond B-2: B-2


Hydrograph
26.99 cfs
22.59 cfs
Inflow Area=6.822 ac
Peak Elev=723.71'
Storage=35,527 cf
Inflow
Primary
Flow (cfs)
Time (hours)
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond B-3: B-3

Inflow Area = 4.269 ac, 3.16% Impervious, Inflow Depth = 4.70" for 25 YR event
Inflow = 18.67 cfs @ 12.17 hrs, Volume= 1.673 af
Outflow = 16.38 cfs @ 12.25 hrs, Volume= 1.673 af, Atten= 12%, Lag= 4.7 min
Primary = 16.38 cfs @ 12.25 hrs, Volume= 1.673 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Starting Elev= 736.05' Surf.Area= 5,881 sf Storage= 5,653 cf
Peak Elev= 737.63' @ 12.25 hrs Surf.Area= 7,477 sf Storage= 16,216 cf (10,564 cf above start)

Plug-Flow detention time= 94.3 min calculated for 1.543 af (92% of inflow)
Center-of-Mass det. time= 36.2 min (852.1 - 816.0)

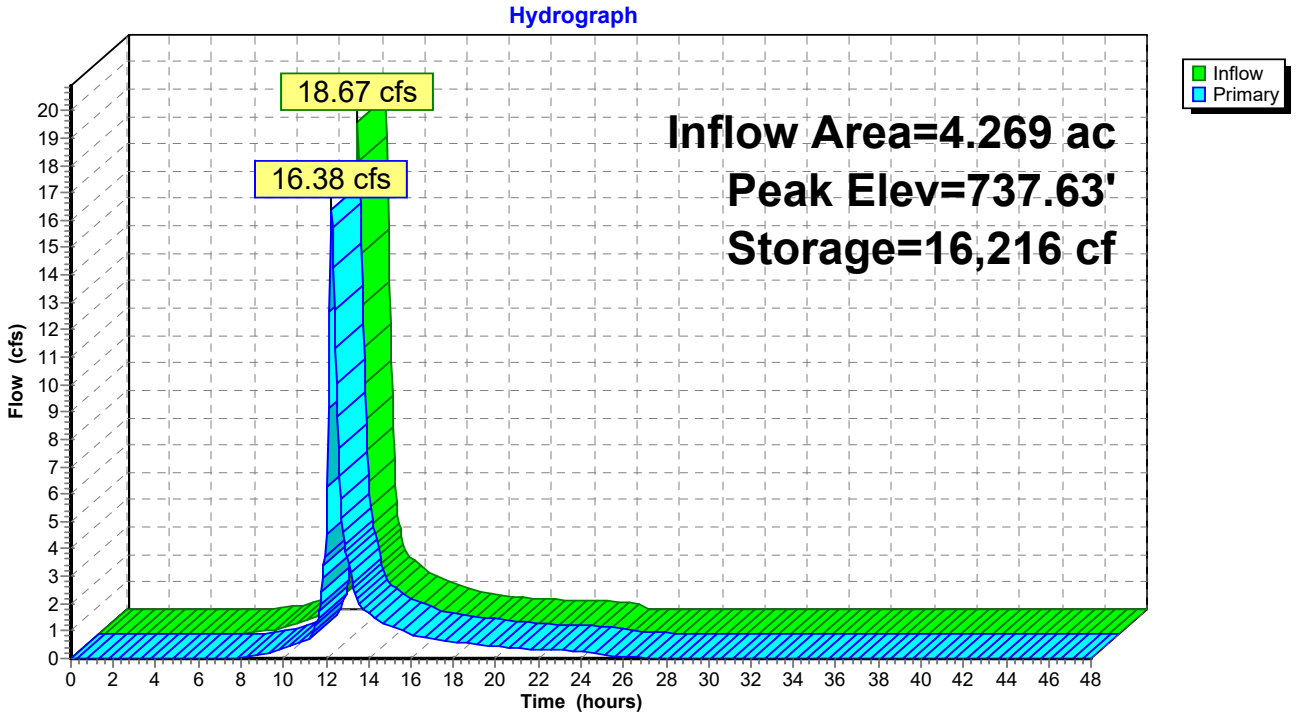
Volume	Invert	Avail.Storage	Storage Description
#1	735.00'	27,433 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
735.00	4,900	301.5	0	0	4,900
736.00	5,833	320.3	5,360	5,360	5,881
737.00	6,822	339.2	6,321	11,681	6,926
738.00	7,868	358.0	7,339	19,020	8,026
739.00	8,971	376.9	8,413	27,433	9,191

Device	Routing	Invert	Outlet Devices
#1	Primary	735.50'	**12.0" Round Culvert** L= 28.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 735.50' / 735.00' S= 0.0179 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	736.05'	**12.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	736.50'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	737.00'	**8.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=16.33 cfs @ 12.25 hrs HW=737.63' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 4.02 cfs of 4.83 cfs potential flow)
  - **3=Orifice/Grate** (Orifice Controls 4.02 cfs @ 5.12 fps)
- **2=Orifice/Grate** (Orifice Controls 1.45 cfs @ 5.81 fps)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 10.85 cfs @ 2.14 fps)

Pond B-3: B-3

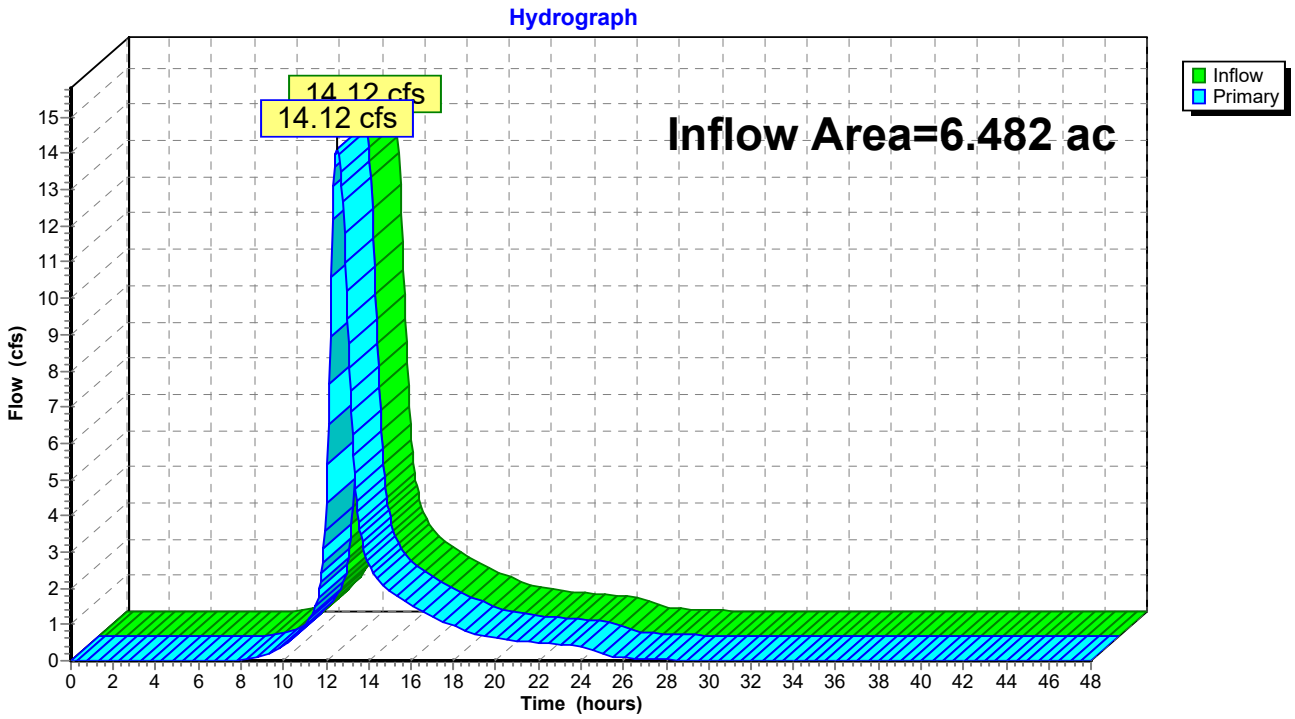

Hydrograph
18.67 cfs
16.38 cfs
Inflow Area=4.269 ac
Peak Elev=737.63'
Storage=16,216 cf
Inflow
Primary
Flow (cfs)
Time (hours)

Summary for Link AP-1: AP-1

Inflow Area = 6.482 ac, 2.62% Impervious, Inflow Depth = 4.53" for 25 YR event
Inflow = 14.12 cfs @ 12.52 hrs, Volume= 2.446 af
Primary = 14.12 cfs @ 12.52 hrs, Volume= 2.446 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link AP-1: AP-1

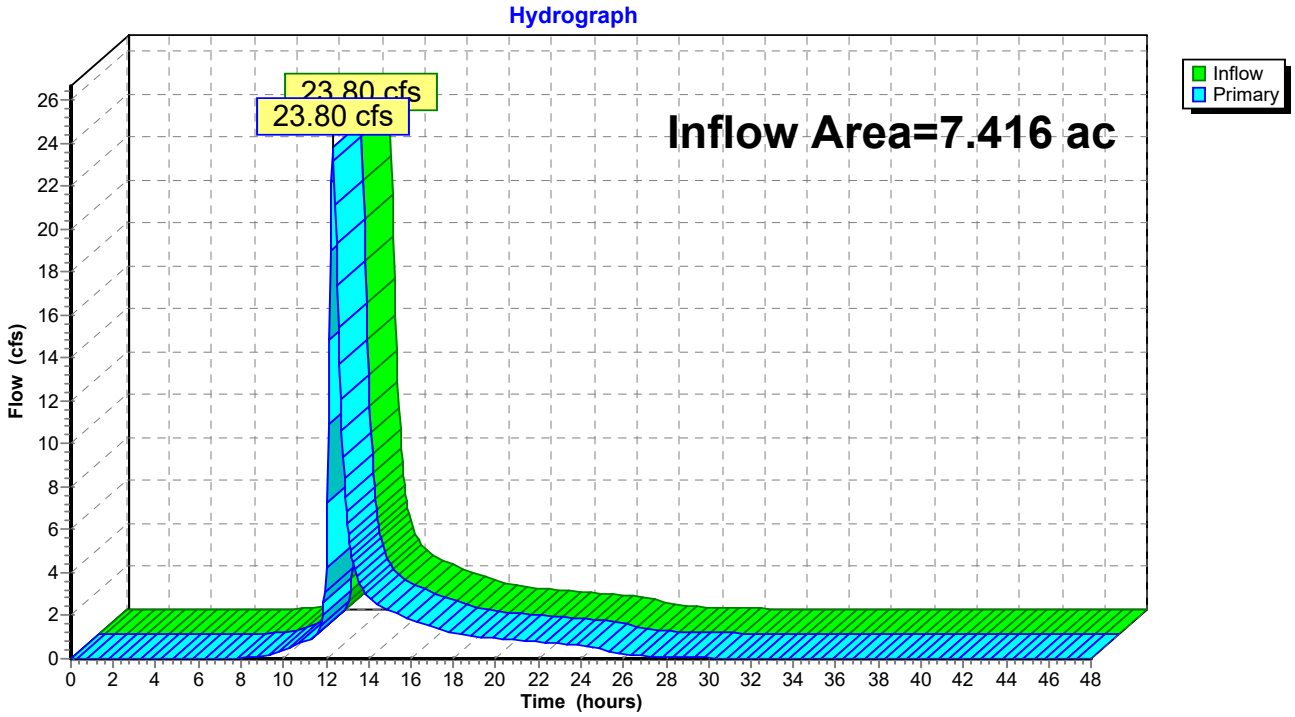


Summary for Link AP-2: AP-2

Inflow Area = 7.416 ac, 3.82% Impervious, Inflow Depth = 4.67" for 25 YR event
Inflow = 23.80 cfs @ 12.33 hrs, Volume= 2.889 af
Primary = 23.80 cfs @ 12.33 hrs, Volume= 2.889 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link AP-2: AP-2

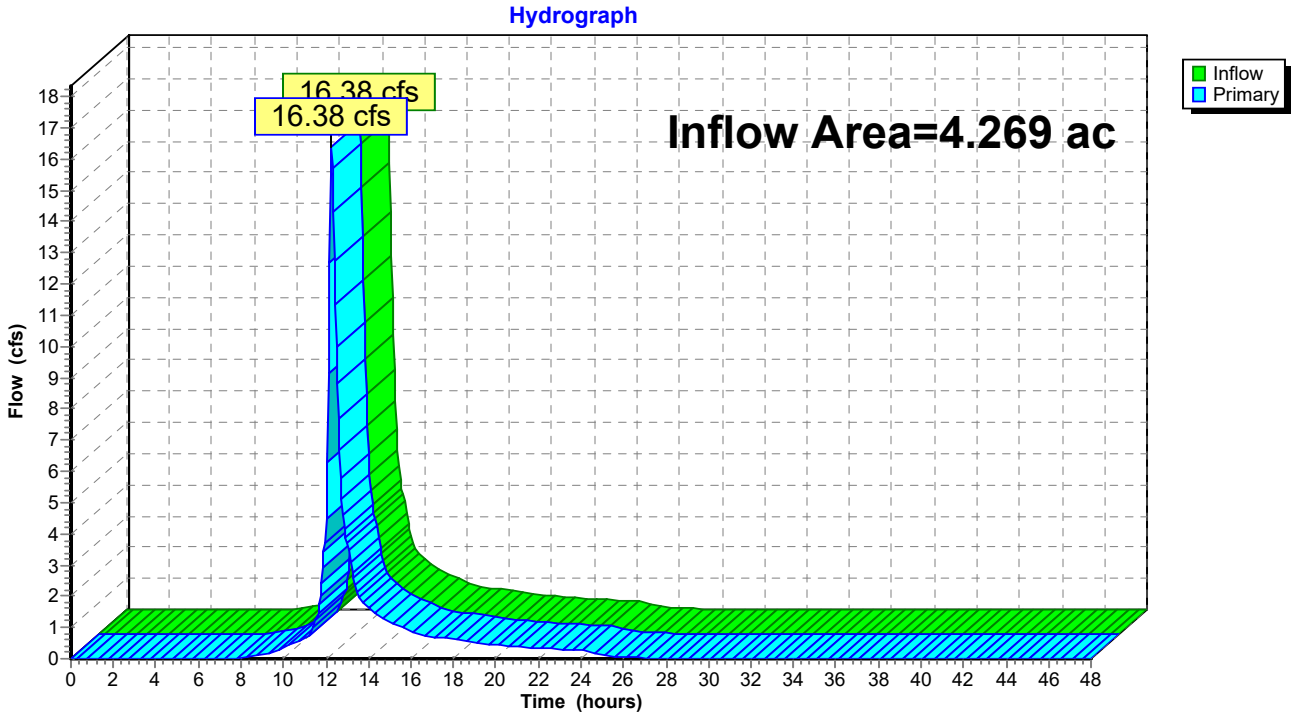


Summary for Link AP-3: AP-3

Inflow Area = 4.269 ac, 3.16% Impervious, Inflow Depth = 4.70" for 25 YR event
Inflow = 16.38 cfs @ 12.25 hrs, Volume= 1.673 af
Primary = 16.38 cfs @ 12.25 hrs, Volume= 1.673 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link AP-3: AP-3



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PDA-1A: PDA-1A Runoff Area=3.636 ac 0.00% Impervious Runoff Depth=5.38"
Flow Length=552' Tc=22.5 min CN=77 Runoff=14.62 cfs 1.632 af

Subcatchment PDA-1B: PDA-1B Runoff Area=2.472 ac 6.88% Impervious Runoff Depth=5.62"
Flow Length=357' Tc=21.4 min CN=79 Runoff=10.54 cfs 1.158 af

Subcatchment PDA-1C: PDA-1C Runoff Area=0.374 ac 0.00% Impervious Runoff Depth=4.68"
Tc=6.0 min CN=71 Runoff=2.01 cfs 0.146 af

Subcatchment PDA-2A: PDA-2A Runoff Area=4.026 ac 7.03% Impervious Runoff Depth=5.62"
Flow Length=278' Tc=18.6 min CN=79 Runoff=18.19 cfs 1.885 af

Subcatchment PDA-2B: PDA-2B Runoff Area=2.796 ac 0.00% Impervious Runoff Depth=5.62"
Flow Length=491' Tc=12.0 min CN=79 Runoff=14.87 cfs 1.309 af

Subcatchment PDA-2C: PDA-2C Runoff Area=0.594 ac 0.00% Impervious Runoff Depth=5.27"
Tc=6.0 min CN=76 Runoff=3.57 cfs 0.261 af

Subcatchment PDA-3: PDA-3 Runoff Area=4.269 ac 3.16% Impervious Runoff Depth=5.62"
Flow Length=473' Tc=12.8 min CN=79 Runoff=22.20 cfs 1.999 af

Reach SW-2: SW-2 Avg. Flow Depth=0.52' Max Vel=6.12 fps Inflow=14.87 cfs 1.309 af
n=0.030 L=518.8' S=0.0558 '/' Capacity=122.75 cfs Outflow=14.66 cfs 1.309 af

Pond B-1A: B-1A Peak Elev=699.74' Storage=11,927 cf Inflow=14.62 cfs 1.632 af
Outflow=10.87 cfs 1.631 af

Pond B-1B: B-1B Peak Elev=700.80' Storage=20,945 cf Inflow=10.54 cfs 1.158 af
Outflow=6.63 cfs 1.157 af

Pond B-2: B-2 Peak Elev=723.84' Storage=37,440 cf Inflow=32.09 cfs 3.195 af
Outflow=27.70 cfs 3.193 af

Pond B-3: B-3 Peak Elev=737.75' Storage=17,105 cf Inflow=22.20 cfs 1.999 af
Outflow=19.72 cfs 1.999 af

Link AP-1: AP-1 Inflow=17.94 cfs 2.934 af
Primary=17.94 cfs 2.934 af

Link AP-2: AP-2 Inflow=29.18 cfs 3.454 af
Primary=29.18 cfs 3.454 af

Link AP-3: AP-3 Inflow=19.72 cfs 1.999 af
Primary=19.72 cfs 1.999 af

Total Runoff Area = 18.167 ac Runoff Volume = 8.390 af Average Runoff Depth = 5.54"
96.76% Pervious = 17.579 ac 3.24% Impervious = 0.588 ac

Summary for Subcatchment PDA-1A: PDA-1A

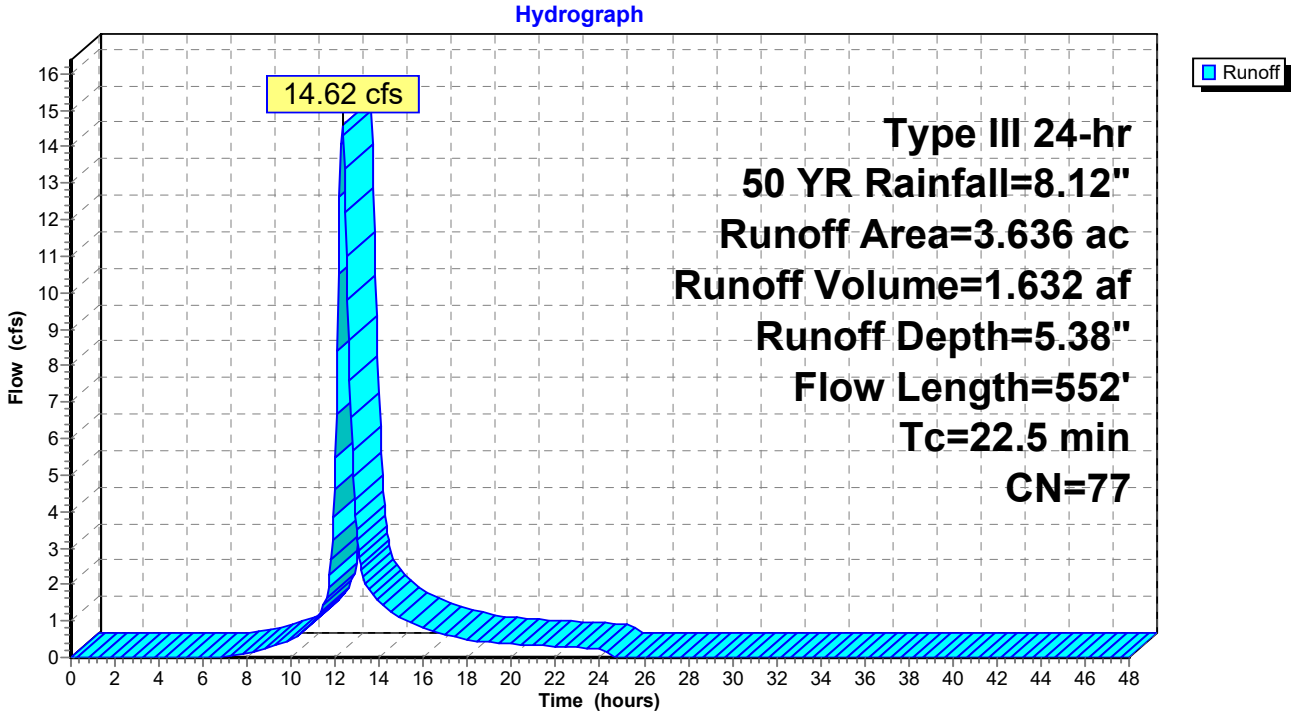
Runoff = 14.62 cfs @ 12.31 hrs, Volume= 1.632 af, Depth= 5.38"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YR Rainfall=8.12"

Area (ac)	CN	Description
0.308	71	Meadow, non-grazed, HSG C
3.328	78	Meadow, non-grazed, HSG D
3.636	77	Weighted Average
3.636		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0104	0.10		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.61"
3.1	203	0.0238	1.08		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.6	181	0.0761	1.93		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
0.3	68	0.3333	4.04		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
22.5	552	Total			

Subcatchment PDA-1A: PDA-1A



Summary for Subcatchment PDA-1B: PDA-1B

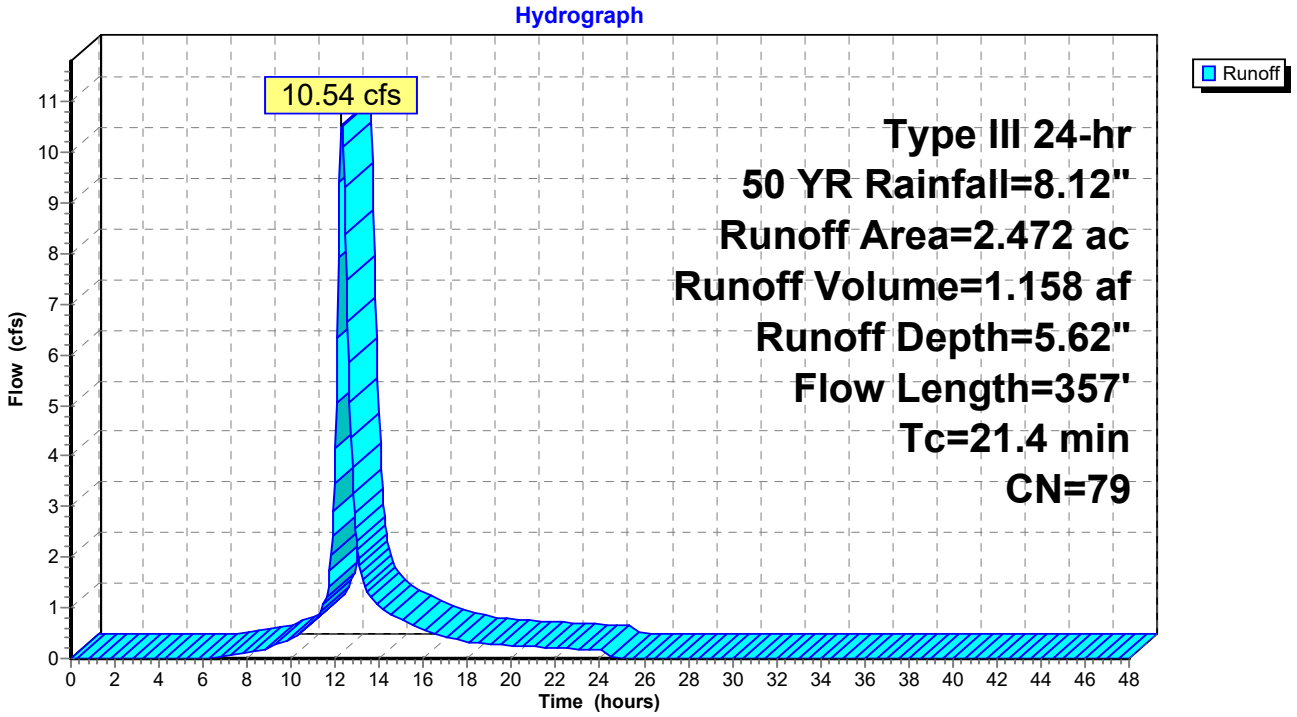
Runoff = 10.54 cfs @ 12.29 hrs, Volume= 1.158 af, Depth= 5.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YR Rainfall=8.12"

Area (ac)	CN	Description
0.014	71	Meadow, non-grazed, HSG C
2.288	78	Meadow, non-grazed, HSG D
0.170	98	Water Surface, HSG D
2.472	79	Weighted Average
2.302		93.12% Pervious Area
0.170		6.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.4	100	0.0070	0.08		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.61"
0.5	36	0.0338	1.29		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.3	162	0.0500	10.58	118.47	**Channel Flow, D-E** Area= 11.2 sf Perim= 12.0' r= 0.93' n= 0.030 Earth, grassed & winding
0.2	59	0.3333	4.04		**Shallow Concentrated Flow, E-F** Short Grass Pasture Kv= 7.0 fps
21.4	357	Total			

Subcatchment PDA-1B: PDA-1B



Summary for Subcatchment PDA-1C: PDA-1C

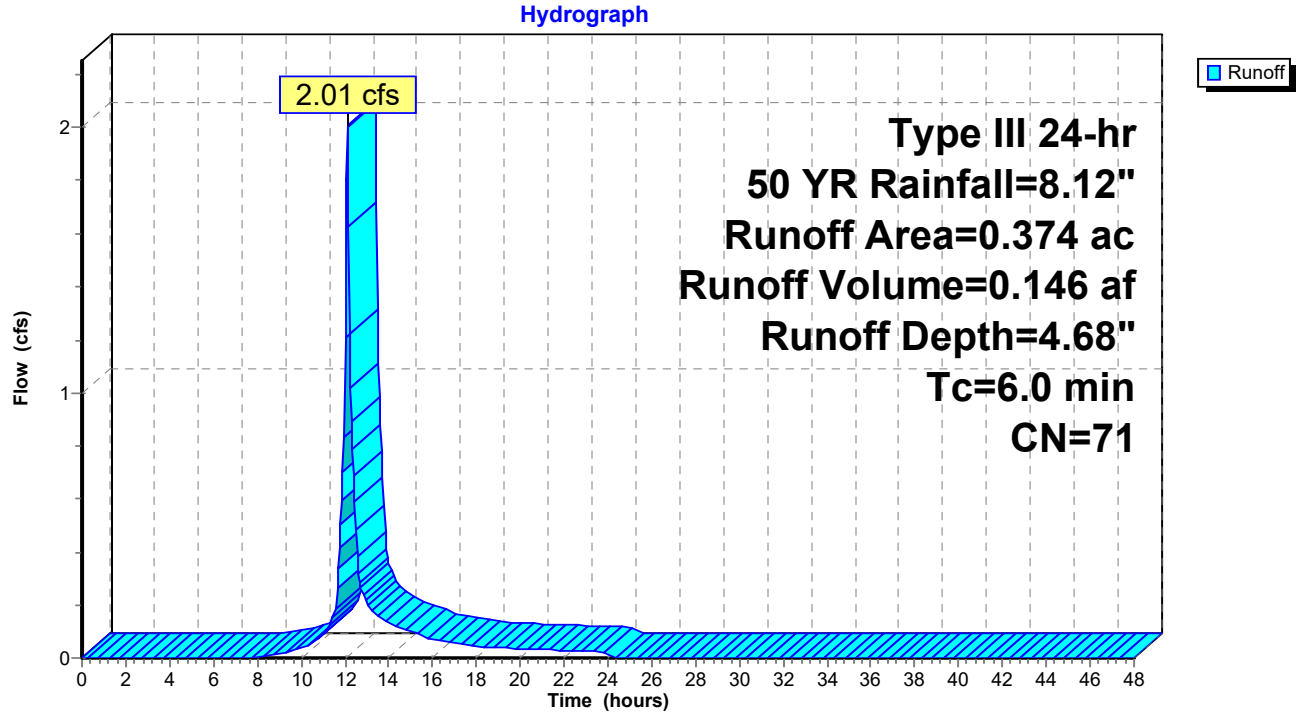
Runoff = 2.01 cfs @ 12.09 hrs, Volume= 0.146 af, Depth= 4.68"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YR Rainfall=8.12"

Area (ac)	CN	Description
0.374	71	Meadow, non-grazed, HSG C
0.374		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PDA-1C: PDA-1C



Summary for Subcatchment PDA-2A: PDA-2A

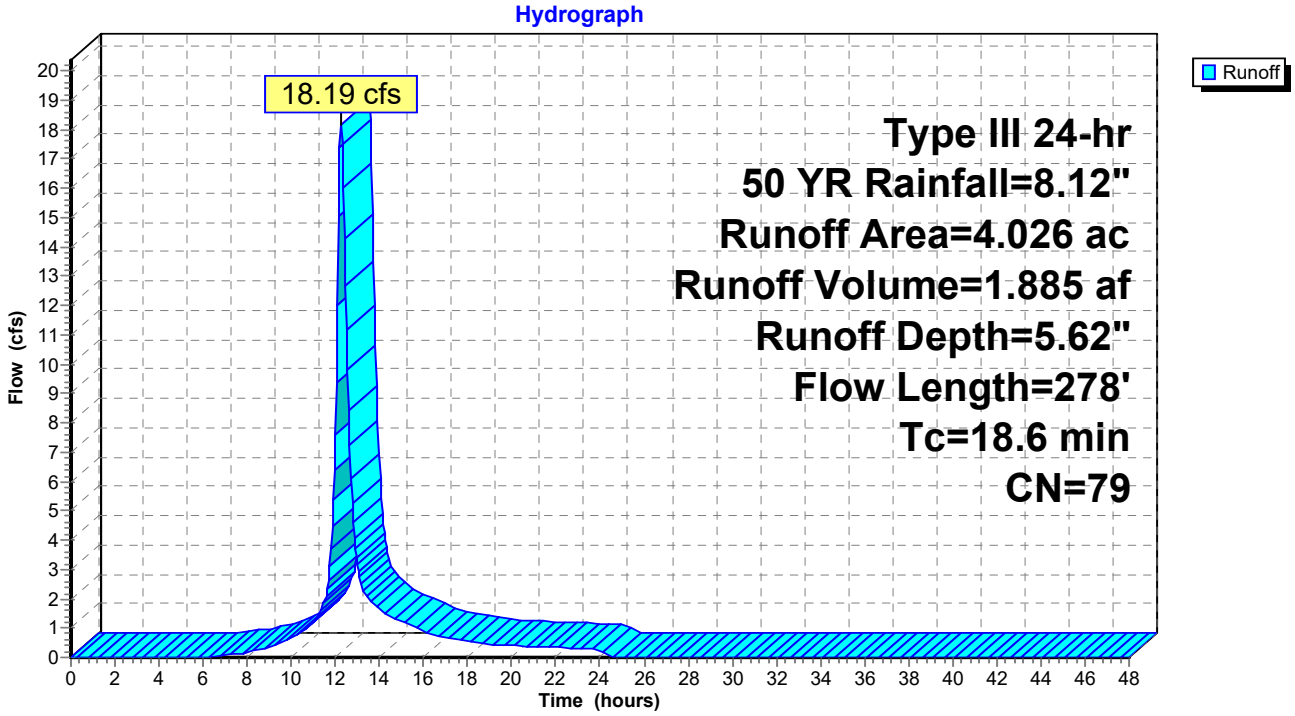
Runoff = 18.19 cfs @ 12.25 hrs, Volume= 1.885 af, Depth= 5.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YR Rainfall=8.12"

Area (ac)	CN	Description
3.742	78	Meadow, non-grazed, HSG D
0.001	96	Gravel surface, HSG D
0.283	98	Water Surface, HSG D
4.026	79	Weighted Average
3.743		92.97% Pervious Area
0.283		7.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6	100	0.0118	0.10		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.61"
2.0	178	0.0428	1.45		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
18.6	278	Total			

Subcatchment PDA-2A: PDA-2A



Summary for Subcatchment PDA-2B: PDA-2B

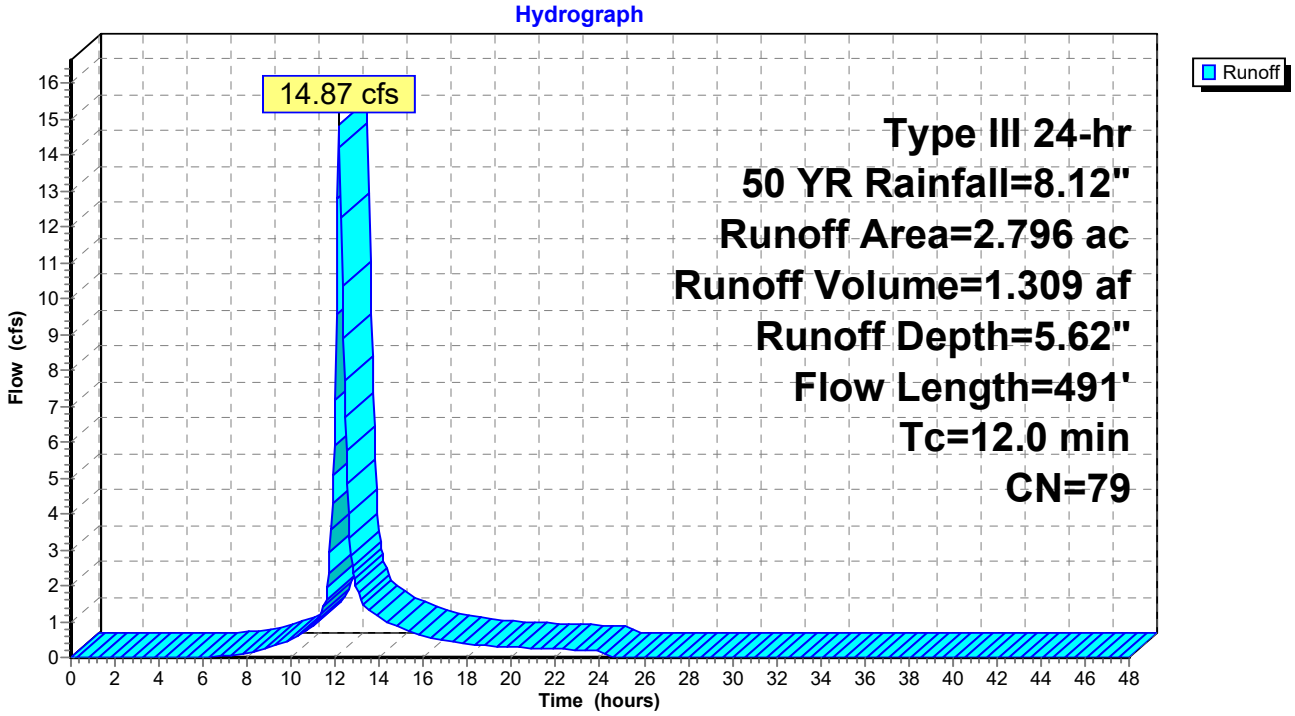
Runoff = 14.87 cfs @ 12.16 hrs, Volume= 1.309 af, Depth= 5.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YR Rainfall=8.12"

Area (ac)	CN	Description
2.633	78	Meadow, non-grazed, HSG D
0.163	96	Gravel surface, HSG D
2.796	79	Weighted Average
2.796		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	100	0.0590	0.19		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.61"
3.2	376	0.0774	1.95		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.1	15	0.2800	3.70		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
12.0	491	Total			

Subcatchment PDA-2B: PDA-2B



Summary for Subcatchment PDA-2C: PDA-2C

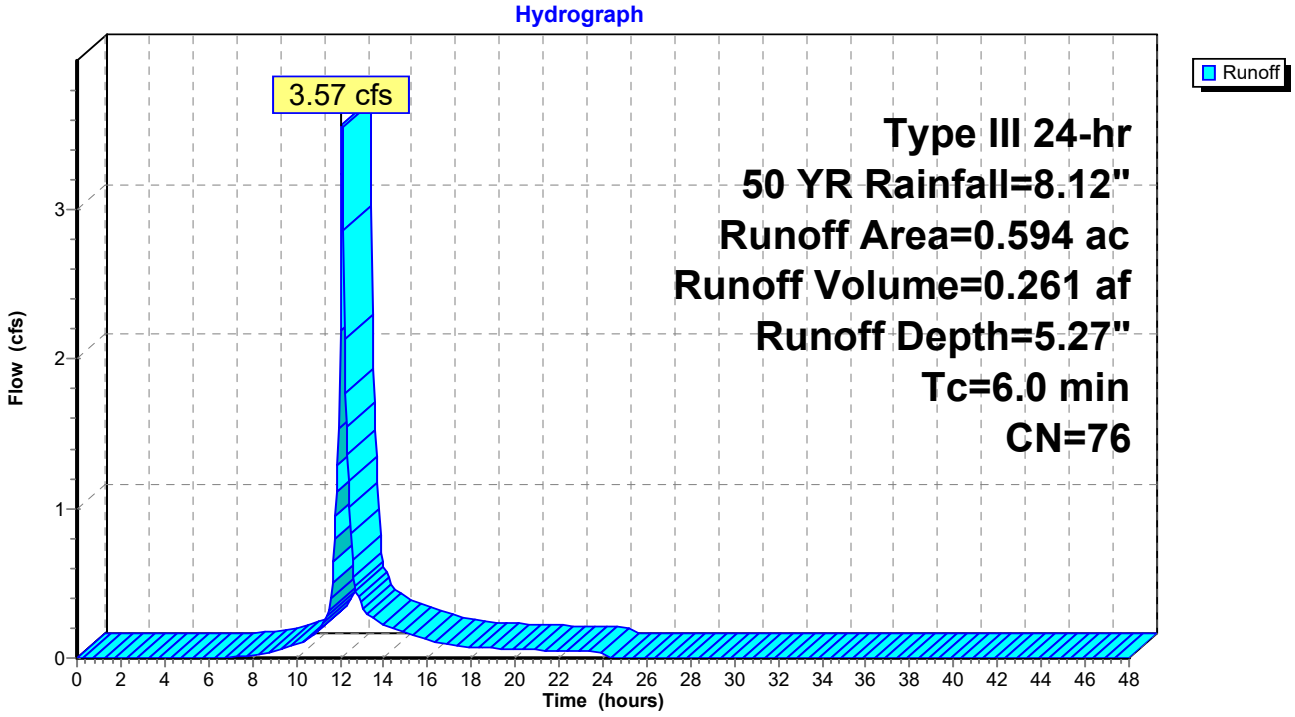
Runoff = 3.57 cfs @ 12.09 hrs, Volume= 0.261 af, Depth= 5.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YR Rainfall=8.12"

Area (ac)	CN	Description
0.156	71	Meadow, non-grazed, HSG C
0.438	78	Meadow, non-grazed, HSG D
0.594	76	Weighted Average
0.594		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PDA-2C: PDA-2C



Summary for Subcatchment PDA-3: PDA-3

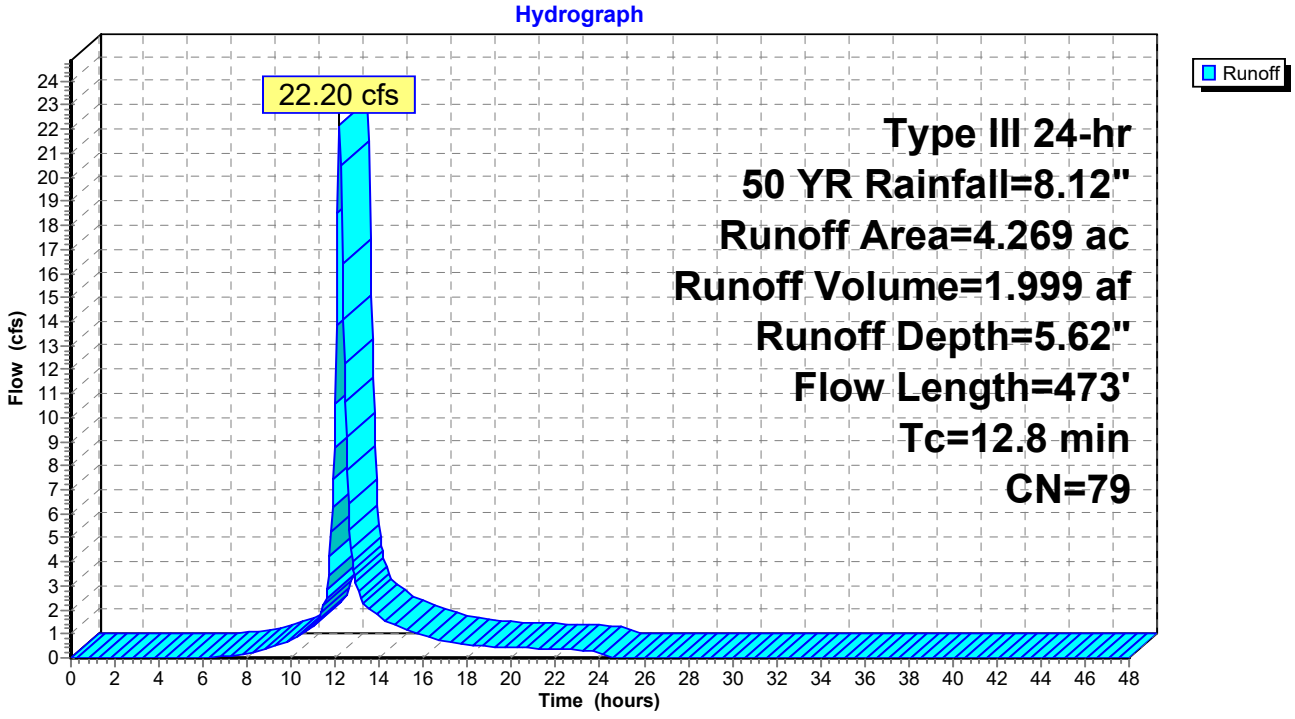
Runoff = 22.20 cfs @ 12.17 hrs, Volume= 1.999 af, Depth= 5.62"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 50 YR Rainfall=8.12"

Area (ac)	CN	Description
4.134	78	Meadow, non-grazed, HSG D
0.135	98	Water Surface, HSG D
4.269	79	Weighted Average
4.134		96.84% Pervious Area
0.135		3.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0503	0.18		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.61"
3.5	373	0.0628	1.75		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
12.8	473	Total			

Subcatchment PDA-3: PDA-3



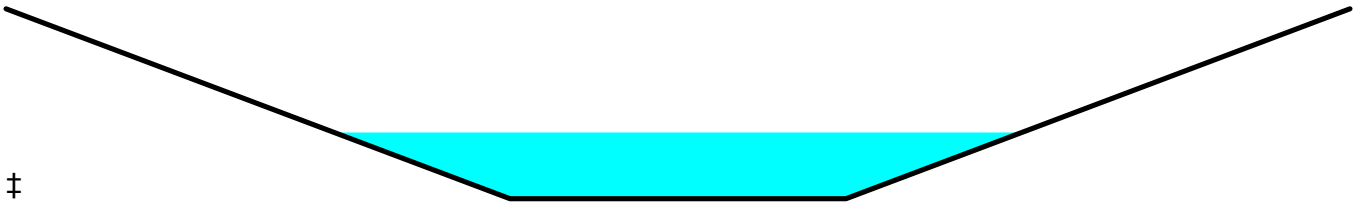
Summary for Reach SW-2: SW-2

Inflow Area = 2.796 ac, 0.00% Impervious, Inflow Depth = 5.62" for 50 YR event
Inflow = 14.87 cfs @ 12.16 hrs, Volume= 1.309 af
Outflow = 14.66 cfs @ 12.18 hrs, Volume= 1.309 af, Atten= 1%, Lag= 1.2 min

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.12 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.89 fps, Avg. Travel Time= 4.6 min

Peak Storage= 1,241 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.52'
Bank-Full Depth= 1.50' Flow Area= 11.3 sf, Capacity= 122.75 cfs

3.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 12.00'
Length= 518.8' Slope= 0.0558 '/'
Inlet Invert= 753.93', Outlet Invert= 725.00'



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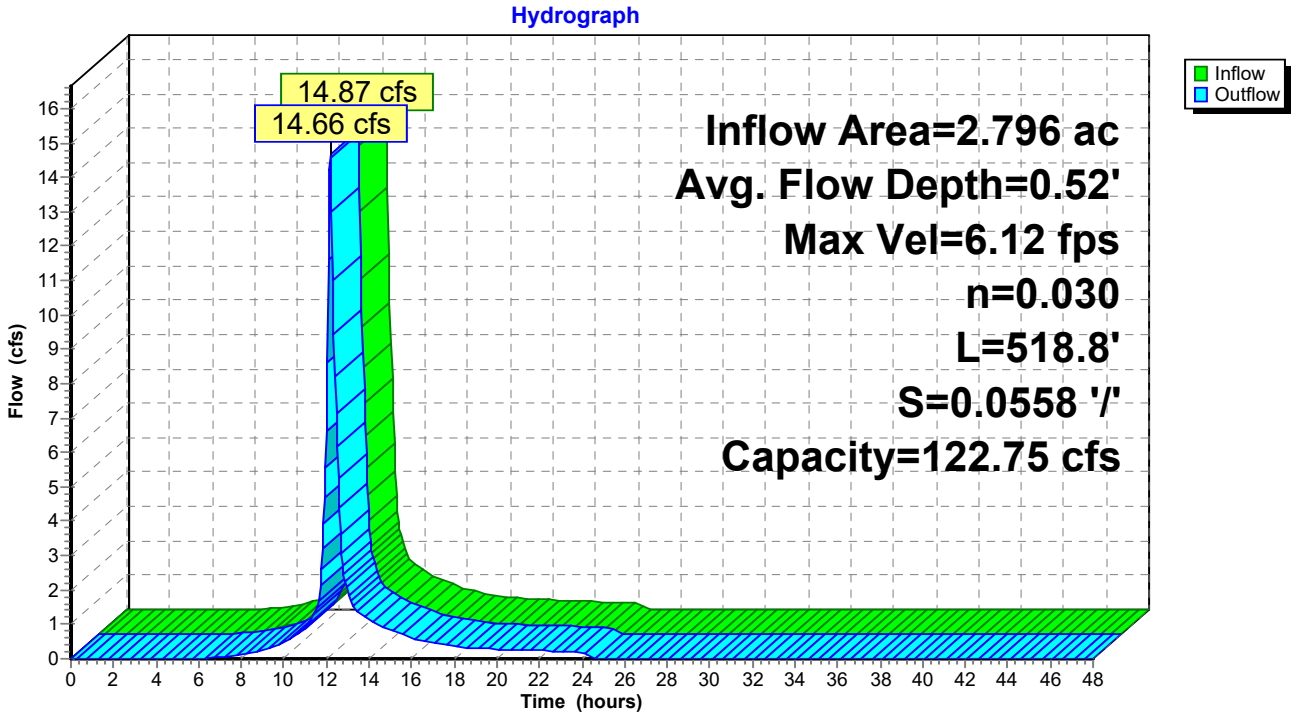
Reach SW-2: SW-2



Summary for Pond B-1A: B-1A

Inflow Area = 3.636 ac, 0.00% Impervious, Inflow Depth = 5.38" for 50 YR event
Inflow = 14.62 cfs @ 12.31 hrs, Volume= 1.632 af
Outflow = 10.87 cfs @ 12.51 hrs, Volume= 1.631 af, Atten= 26%, Lag= 12.3 min
Primary = 10.87 cfs @ 12.51 hrs, Volume= 1.631 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 699.74' @ 12.51 hrs Surf.Area= 5,502 sf Storage= 11,927 cf

Plug-Flow detention time= 25.5 min calculated for 1.629 af (100% of inflow)
Center-of-Mass det. time= 25.9 min (850.4 - 824.4)

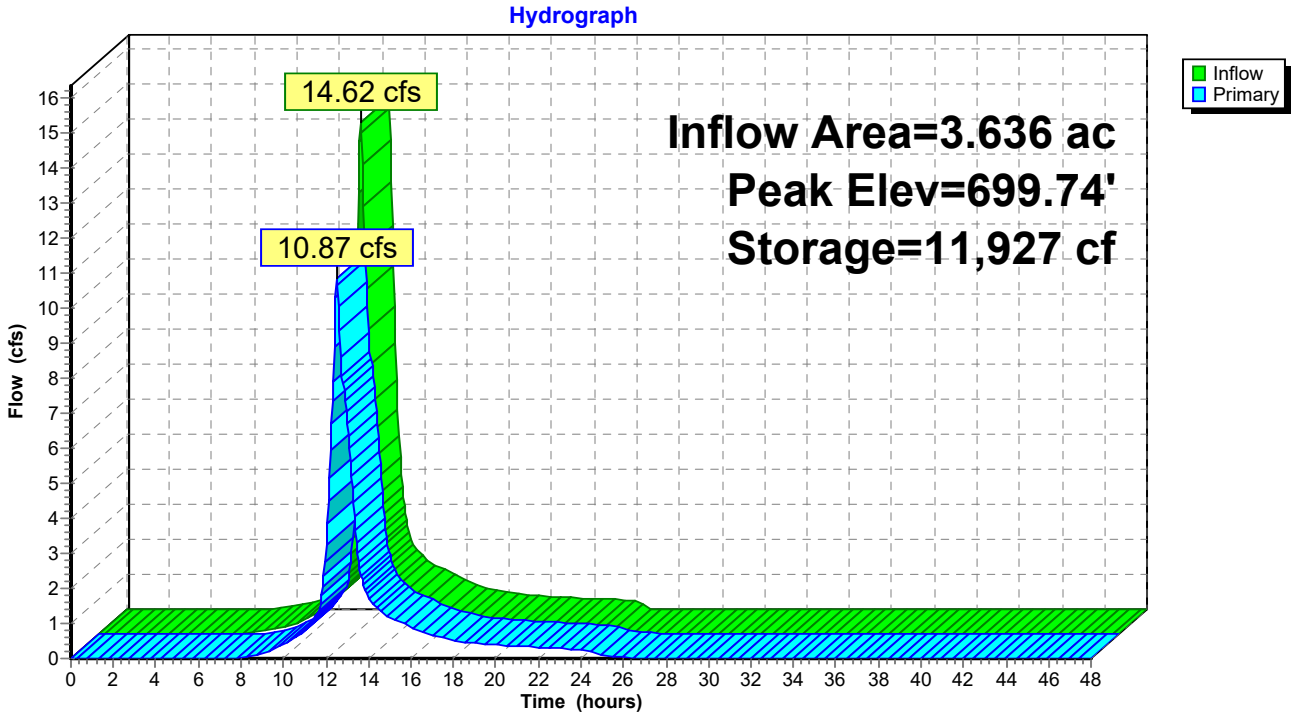
Volume	Invert	Avail.Storage	Storage Description
#1	697.00'	19,586 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
697.00	3,276	245.1	0	0	3,276
698.00	4,040	264.0	3,651	3,651	4,083
699.00	4,860	282.8	4,444	8,095	4,945
700.00	5,737	301.7	5,292	13,387	5,872
701.00	6,671	320.5	6,198	19,586	6,853

Device	Routing	Invert	Outlet Devices
#1	Primary	697.00'	**15.0" Round Culvert** L= 31.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 697.00' / 696.00' S= 0.0323 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Primary	699.50'	**7.5' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=10.81 cfs @ 12.51 hrs HW=699.74' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 8.59 cfs @ 7.00 fps)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 2.22 cfs @ 1.25 fps)

Pond B-1A: B-1A


Hydrograph
14.62 cfs
10.87 cfs
Inflow Area=3.636 ac
Peak Elev=699.74'
Storage=11,927 cf
Inflow
Primary
Flow (cfs)
Time (hours)

Summary for Pond B-1B: B-1B

Inflow Area = 2.472 ac, 6.88% Impervious, Inflow Depth = 5.62" for 50 YR event
Inflow = 10.54 cfs @ 12.29 hrs, Volume= 1.158 af
Outflow = 6.63 cfs @ 12.55 hrs, Volume= 1.157 af, Atten= 37%, Lag= 15.7 min
Primary = 6.63 cfs @ 12.55 hrs, Volume= 1.157 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Starting Elev= 699.40' Surf.Area= 7,385 sf Storage= 8,704 cf
Peak Elev= 700.80' @ 12.55 hrs Surf.Area= 10,168 sf Storage= 20,945 cf (12,240 cf above start)

Plug-Flow detention time= 171.0 min calculated for 0.957 af (83% of inflow)
Center-of-Mass det. time= 62.0 min (880.9 - 818.9)

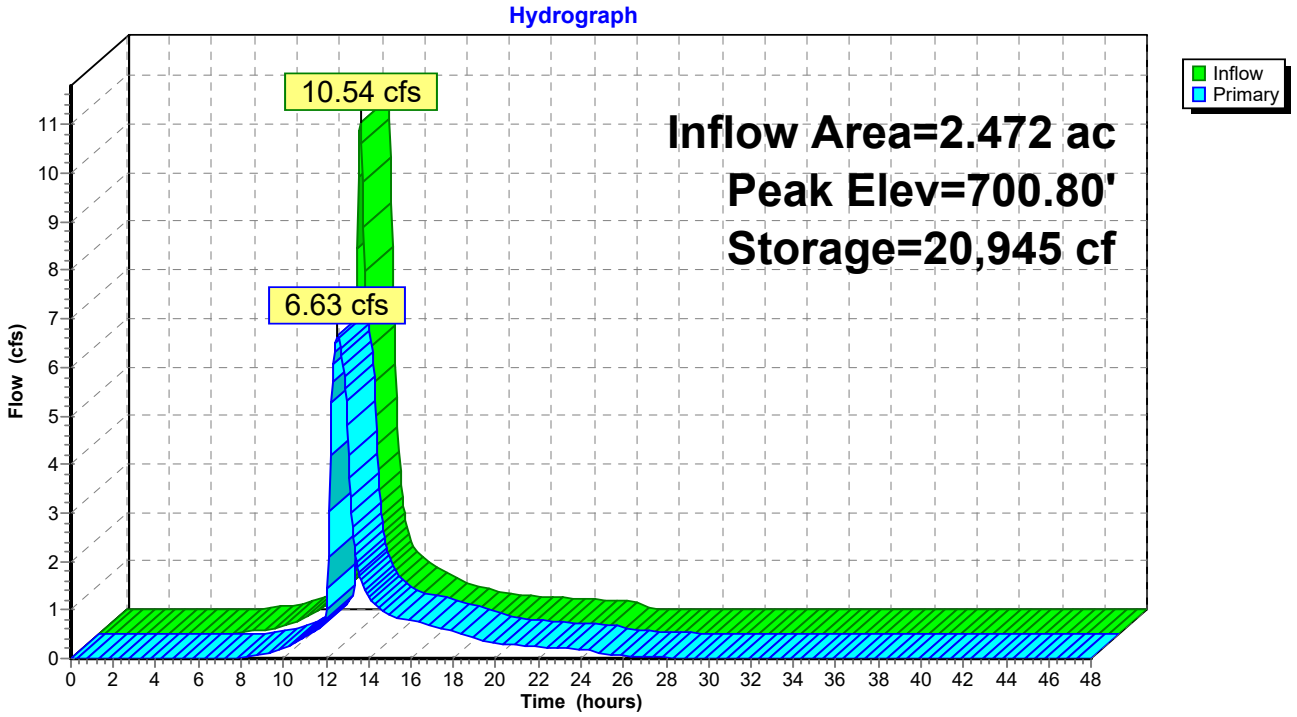
Volume	Invert	Avail.Storage	Storage Description
#1	698.00'	34,674 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
698.00	5,187	405.1	0	0	5,187
699.00	6,643	578.3	5,900	5,900	18,750
700.00	8,572	665.1	7,587	13,487	27,361
701.00	10,596	684.0	9,566	23,053	29,499
702.00	12,676	702.8	11,620	34,674	31,687

Device	Routing	Invert	Outlet Devices
#1	Primary	698.00'	**15.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 698.00' / 697.00' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	699.40'	**12.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	700.00'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	700.90'	**3.0' long x 15.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=6.63 cfs @ 12.55 hrs HW=700.80' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 6.63 cfs of 8.71 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 1.36 cfs @ 5.43 fps)
  - **3=Orifice/Grate** (Orifice Controls 5.27 cfs @ 4.30 fps)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond B-1B: B-1B


Hydrograph
10.54 cfs
6.63 cfs
Inflow Area=2.472 ac
Peak Elev=700.80'
Storage=20,945 cf
Inflow
Primary
Flow (cfs)
Time (hours)
0 1 2 3 4 5 6 7 8 9 10 11
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond B-2: B-2

Inflow Area = 6.822 ac, 4.15% Impervious, Inflow Depth = 5.62" for 50 YR event
Inflow = 32.09 cfs @ 12.21 hrs, Volume= 3.195 af
Outflow = 27.70 cfs @ 12.32 hrs, Volume= 3.193 af, Atten= 14%, Lag= 6.3 min
Primary = 27.70 cfs @ 12.32 hrs, Volume= 3.193 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Starting Elev= 721.85' Surf.Area= 12,337 sf Storage= 9,974 cf
Peak Elev= 723.84' @ 12.32 hrs Surf.Area= 15,306 sf Storage= 37,440 cf (27,466 cf above start)

Plug-Flow detention time= 135.3 min calculated for 2.964 af (93% of inflow)
Center-of-Mass det. time= 79.0 min (894.0 - 815.0)

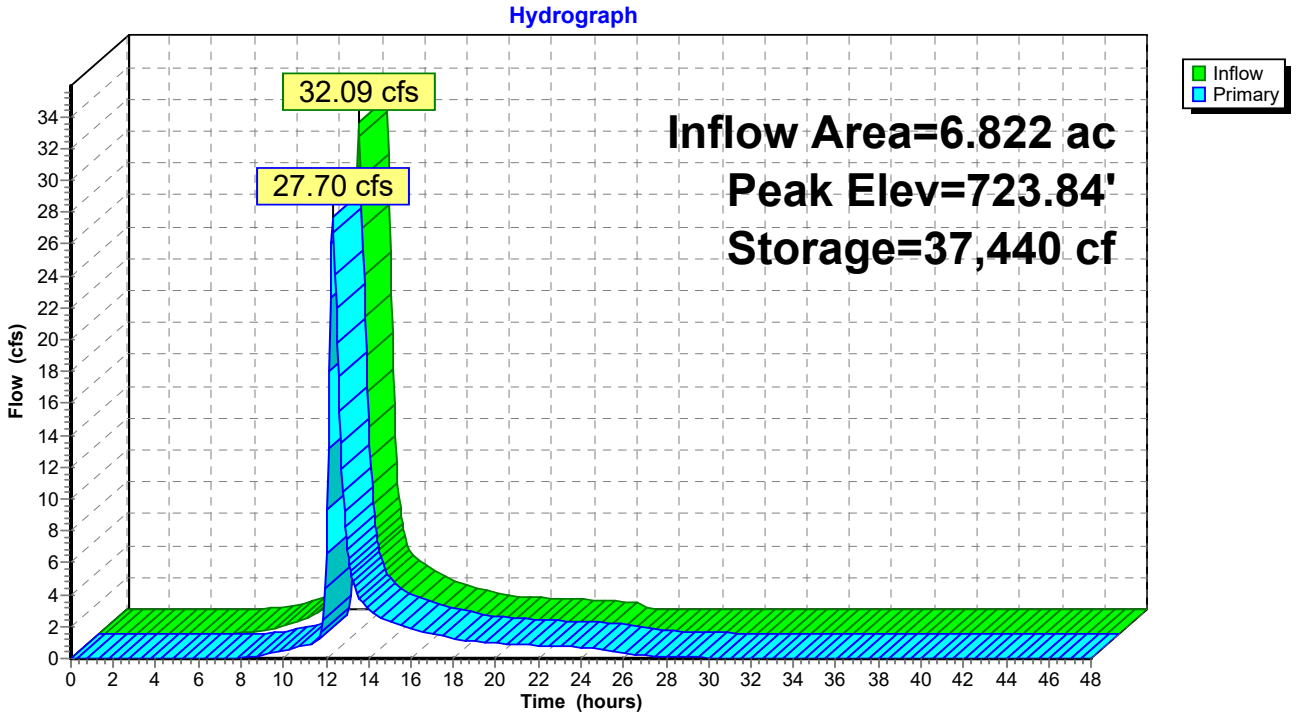
Volume	Invert	Avail.Storage	Storage Description
#1	721.00'	56,252 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
721.00	11,140	462.4	0	0	11,140
722.00	12,555	481.2	11,840	11,840	12,628
723.00	14,027	500.1	13,284	25,125	14,184
724.00	15,556	518.9	14,785	39,910	15,791
725.00	17,141	537.8	16,342	56,252	17,466

Device	Routing	Invert	Outlet Devices
#1	Primary	720.50'	**12.0" Round Culvert** L= 34.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 720.50' / 720.00' S= 0.0147 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	721.85'	**12.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	722.50'	**12.0" Vert. Orifice/Grate** C= 0.600
#4	Primary	723.00'	**11.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=27.50 cfs @ 12.32 hrs HW=723.84' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 5.10 cfs of 6.37 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 1.64 cfs @ 6.57 fps)
  - **3=Orifice/Grate** (Orifice Controls 3.46 cfs @ 4.40 fps)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 22.40 cfs @ 2.44 fps)

Pond B-2: B-2


Hydrograph
32.09 cfs
27.70 cfs
Inflow Area=6.822 ac
Peak Elev=723.84'
Storage=37,440 cf
Inflow
Primary
Flow (cfs)
Time (hours)

Summary for Pond B-3: B-3

Inflow Area = 4.269 ac, 3.16% Impervious, Inflow Depth = 5.62" for 50 YR event
Inflow = 22.20 cfs @ 12.17 hrs, Volume= 1.999 af
Outflow = 19.72 cfs @ 12.25 hrs, Volume= 1.999 af, Atten= 11%, Lag= 4.4 min
Primary = 19.72 cfs @ 12.25 hrs, Volume= 1.999 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Starting Elev= 736.05' Surf.Area= 5,881 sf Storage= 5,653 cf
Peak Elev= 737.75' @ 12.25 hrs Surf.Area= 7,602 sf Storage= 17,105 cf (11,452 cf above start)

Plug-Flow detention time= 84.9 min calculated for 1.869 af (93% of inflow)
Center-of-Mass det. time= 33.7 min (844.7 - 810.9)

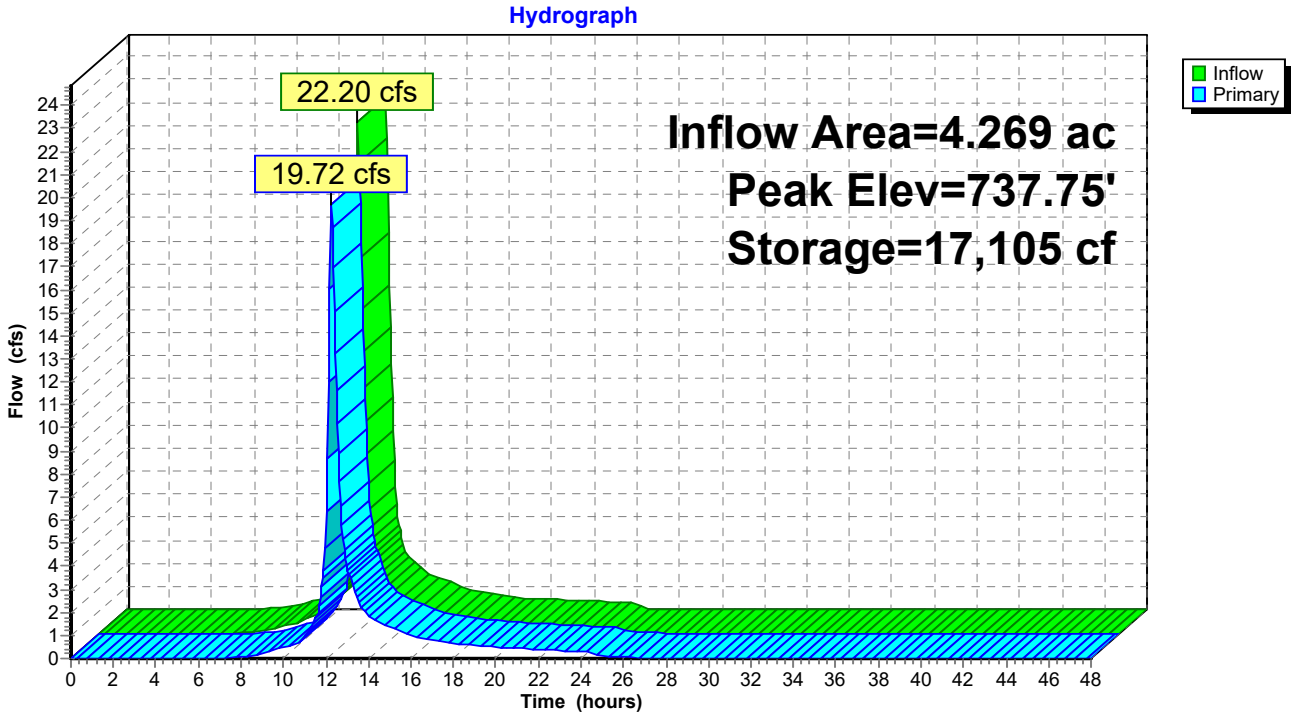
Volume	Invert	Avail.Storage	Storage Description
#1	735.00'	27,433 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
735.00	4,900	301.5	0	0	4,900
736.00	5,833	320.3	5,360	5,360	5,881
737.00	6,822	339.2	6,321	11,681	6,926
738.00	7,868	358.0	7,339	19,020	8,026
739.00	8,971	376.9	8,413	27,433	9,191

Device	Routing	Invert	Outlet Devices
#1	Primary	735.50'	**12.0" Round Culvert** L= 28.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 735.50' / 735.00' S= 0.0179 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	736.05'	**12.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	736.50'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	737.00'	**8.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=19.68 cfs @ 12.25 hrs HW=737.75' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 4.23 cfs of 5.00 cfs potential flow)
  - **3=Orifice/Grate** (Orifice Controls 4.23 cfs @ 5.39 fps)
- **2=Orifice/Grate** (Orifice Controls 1.51 cfs @ 6.04 fps)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 13.94 cfs @ 2.32 fps)

Pond B-3: B-3

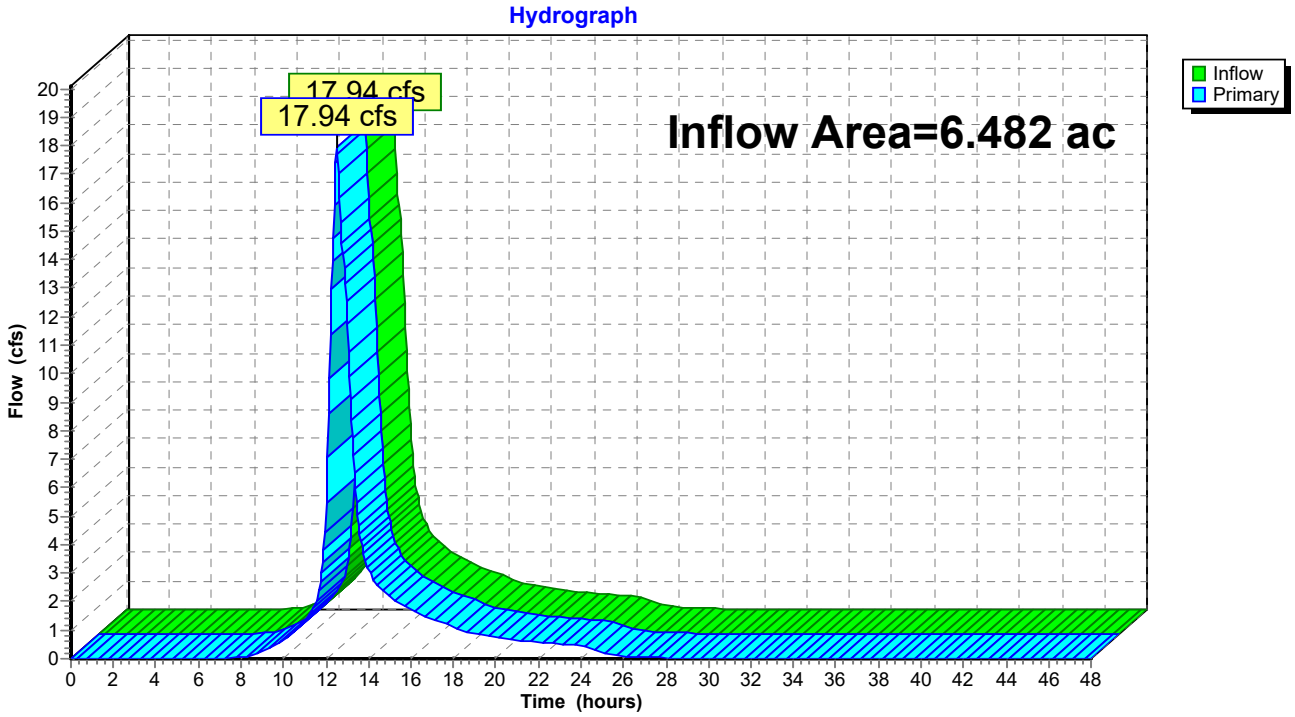

Hydrograph
22.20 cfs
19.72 cfs
Inflow Area=4.269 ac
Peak Elev=737.75'
Storage=17,105 cf
Inflow
Primary
Flow (cfs)
Time (hours)

Summary for Link AP-1: AP-1

Inflow Area = 6.482 ac, 2.62% Impervious, Inflow Depth = 5.43" for 50 YR event
Inflow = 17.94 cfs @ 12.51 hrs, Volume= 2.934 af
Primary = 17.94 cfs @ 12.51 hrs, Volume= 2.934 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link AP-1: AP-1

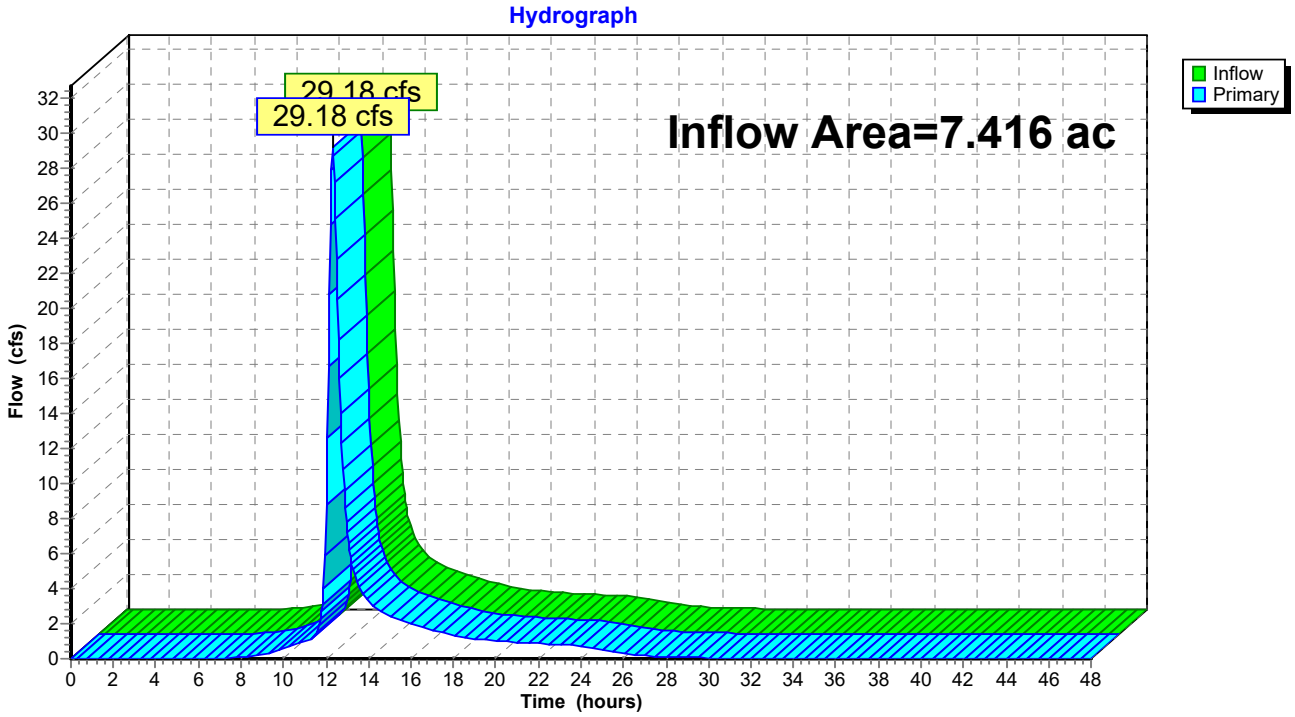


Summary for Link AP-2: AP-2

Inflow Area = 7.416 ac, 3.82% Impervious, Inflow Depth = 5.59" for 50 YR event
Inflow = 29.18 cfs @ 12.31 hrs, Volume= 3.454 af
Primary = 29.18 cfs @ 12.31 hrs, Volume= 3.454 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link AP-2: AP-2

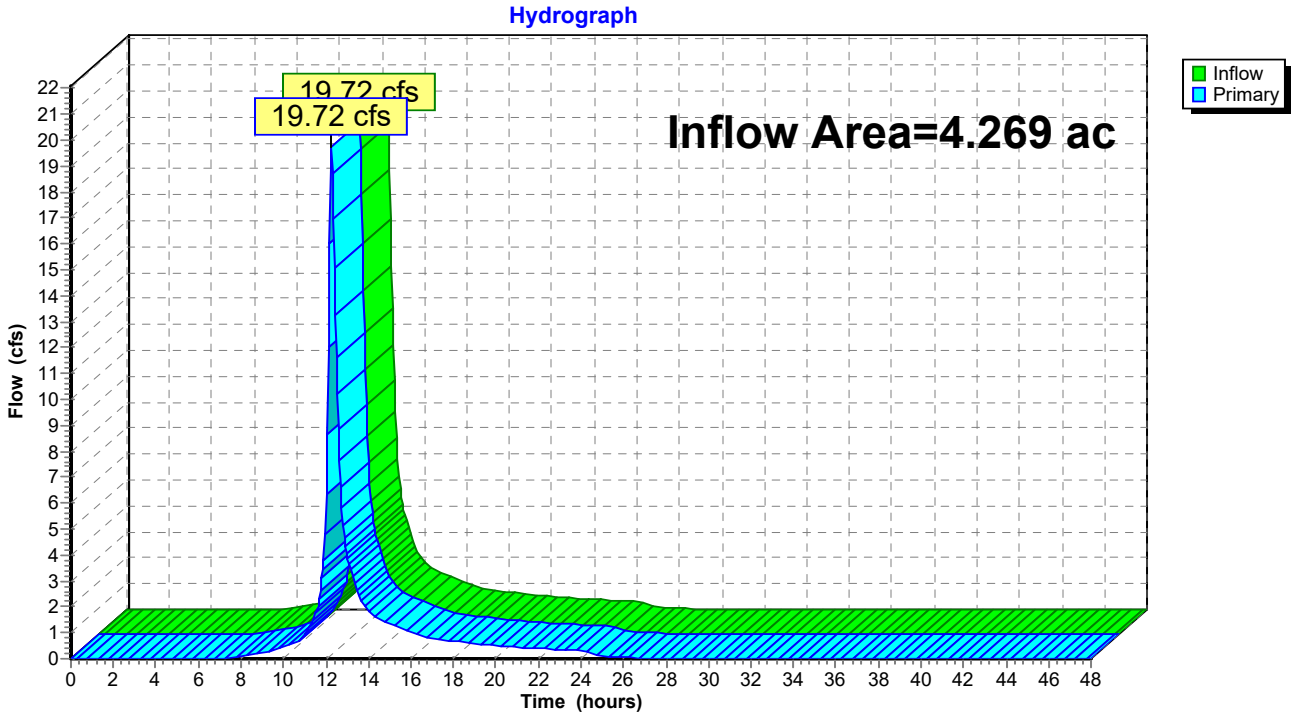


Summary for Link AP-3: AP-3

Inflow Area = 4.269 ac, 3.16% Impervious, Inflow Depth = 5.62" for 50 YR event
Inflow = 19.72 cfs @ 12.25 hrs, Volume= 1.999 af
Primary = 19.72 cfs @ 12.25 hrs, Volume= 1.999 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link AP-3: AP-3



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment PDA-1A: PDA-1A Runoff Area=3.636 ac 0.00% Impervious Runoff Depth=6.39"
Flow Length=552' Tc=22.5 min CN=77 Runoff=17.28 cfs 1.938 af

Subcatchment PDA-1B: PDA-1B Runoff Area=2.472 ac 6.88% Impervious Runoff Depth=6.64"
Flow Length=357' Tc=21.4 min CN=79 Runoff=12.39 cfs 1.369 af

Subcatchment PDA-1C: PDA-1C Runoff Area=0.374 ac 0.00% Impervious Runoff Depth=5.65"
Tc=6.0 min CN=71 Runoff=2.42 cfs 0.176 af

Subcatchment PDA-2A: PDA-2A Runoff Area=4.026 ac 7.03% Impervious Runoff Depth=6.64"
Flow Length=278' Tc=18.6 min CN=79 Runoff=21.38 cfs 2.229 af

Subcatchment PDA-2B: PDA-2B Runoff Area=2.796 ac 0.00% Impervious Runoff Depth=6.64"
Flow Length=491' Tc=12.0 min CN=79 Runoff=17.48 cfs 1.548 af

Subcatchment PDA-2C: PDA-2C Runoff Area=0.594 ac 0.00% Impervious Runoff Depth=6.27"
Tc=6.0 min CN=76 Runoff=4.22 cfs 0.310 af

Subcatchment PDA-3: PDA-3 Runoff Area=4.269 ac 3.16% Impervious Runoff Depth=6.64"
Flow Length=473' Tc=12.8 min CN=79 Runoff=26.08 cfs 2.363 af

Reach SW-2: SW-2 Avg. Flow Depth=0.57' Max Vel=6.40 fps Inflow=17.48 cfs 1.548 af
n=0.030 L=518.8' S=0.0558 '/' Capacity=122.75 cfs Outflow=17.23 cfs 1.548 af

Pond B-1A: B-1A Peak Elev=699.93' Storage=12,968 cf Inflow=17.28 cfs 1.938 af
Outflow=14.46 cfs 1.937 af

Pond B-1B: B-1B Peak Elev=701.00' Storage=23,066 cf Inflow=12.39 cfs 1.369 af
Outflow=7.63 cfs 1.368 af

Pond B-2: B-2 Peak Elev=723.96' Storage=39,323 cf Inflow=37.71 cfs 3.777 af
Outflow=33.04 cfs 3.775 af

Pond B-3: B-3 Peak Elev=737.87' Storage=18,030 cf Inflow=26.08 cfs 2.363 af
Outflow=23.40 cfs 2.363 af

Link AP-1: AP-1 Inflow=22.51 cfs 3.481 af
Primary=22.51 cfs 3.481 af

Link AP-2: AP-2 Inflow=34.81 cfs 4.085 af
Primary=34.81 cfs 4.085 af

Link AP-3: AP-3 Inflow=23.40 cfs 2.363 af
Primary=23.40 cfs 2.363 af

Total Runoff Area = 18.167 ac Runoff Volume = 9.933 af Average Runoff Depth = 6.56"
96.76% Pervious = 17.579 ac 3.24% Impervious = 0.588 ac

Summary for Subcatchment PDA-1A: PDA-1A

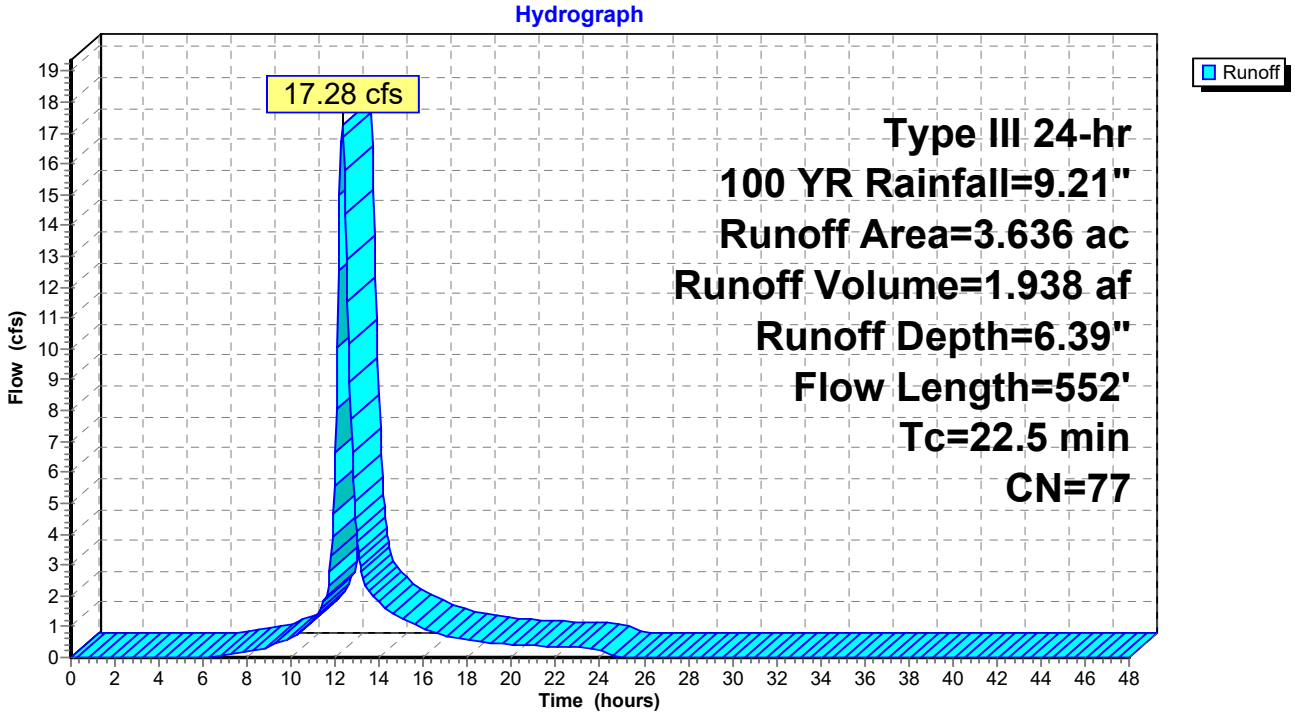
Runoff = 17.28 cfs @ 12.31 hrs, Volume= 1.938 af, Depth= 6.39"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=9.21"

Area (ac)	CN	Description
0.308	71	Meadow, non-grazed, HSG C
3.328	78	Meadow, non-grazed, HSG D
3.636	77	Weighted Average
3.636		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
17.5	100	0.0104	0.10		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.61"
3.1	203	0.0238	1.08		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
1.6	181	0.0761	1.93		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
0.3	68	0.3333	4.04		**Shallow Concentrated Flow, D-E** Short Grass Pasture Kv= 7.0 fps
22.5	552	Total			

Subcatchment PDA-1A: PDA-1A



Summary for Subcatchment PDA-1B: PDA-1B

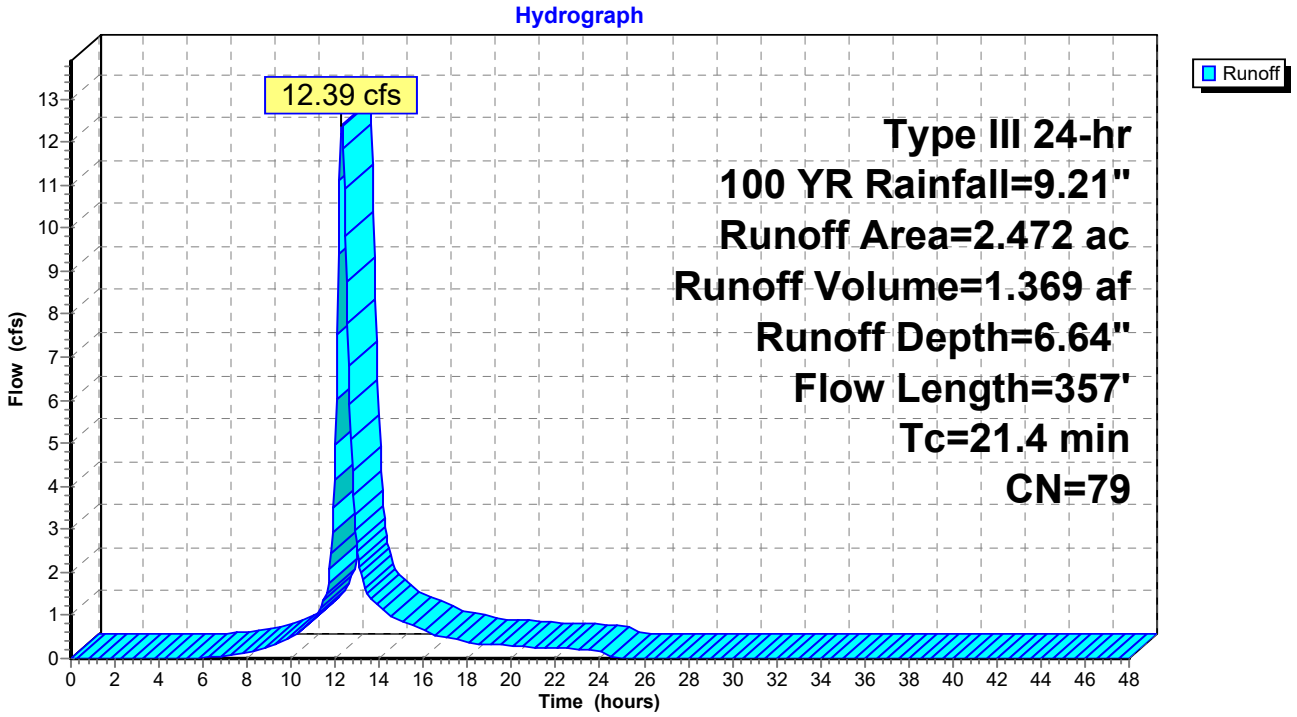
Runoff = 12.39 cfs @ 12.29 hrs, Volume= 1.369 af, Depth= 6.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=9.21"

Area (ac)	CN	Description
0.014	71	Meadow, non-grazed, HSG C
2.288	78	Meadow, non-grazed, HSG D
0.170	98	Water Surface, HSG D
2.472	79	Weighted Average
2.302		93.12% Pervious Area
0.170		6.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
20.4	100	0.0070	0.08		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.61"
0.5	36	0.0338	1.29		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.3	162	0.0500	10.58	118.47	**Channel Flow, D-E** Area= 11.2 sf Perim= 12.0' r= 0.93' n= 0.030 Earth, grassed & winding
0.2	59	0.3333	4.04		**Shallow Concentrated Flow, E-F** Short Grass Pasture Kv= 7.0 fps
21.4	357	Total			

Subcatchment PDA-1B: PDA-1B



Summary for Subcatchment PDA-1C: PDA-1C

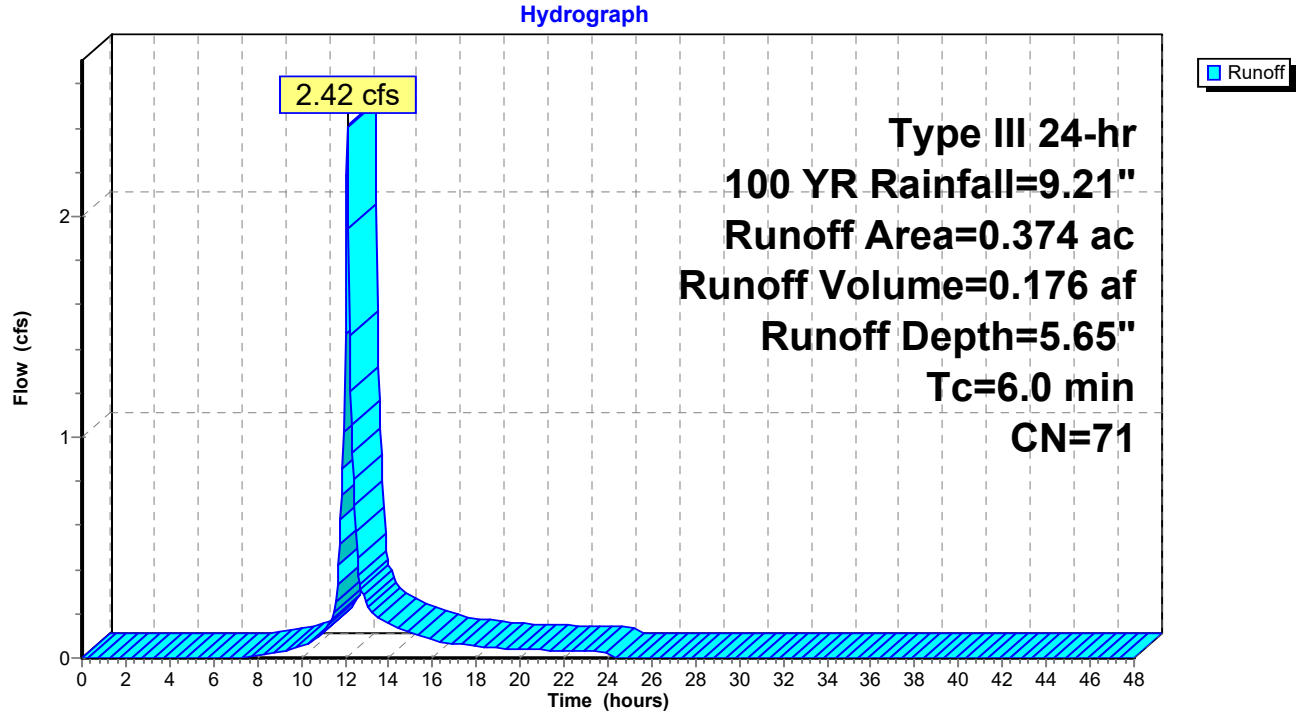
Runoff = 2.42 cfs @ 12.09 hrs, Volume= 0.176 af, Depth= 5.65"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=9.21"

Area (ac)	CN	Description
0.374	71	Meadow, non-grazed, HSG C
0.374		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PDA-1C: PDA-1C



Summary for Subcatchment PDA-2A: PDA-2A

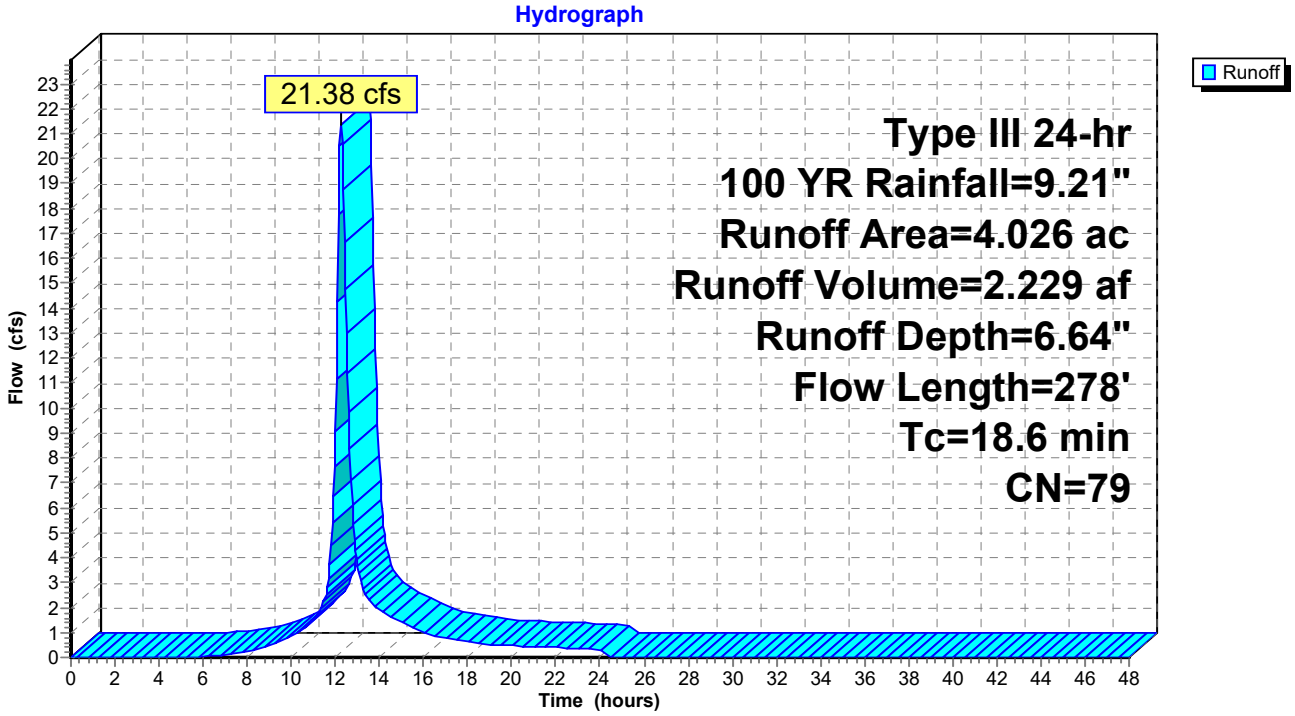
Runoff = 21.38 cfs @ 12.25 hrs, Volume= 2.229 af, Depth= 6.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=9.21"

Area (ac)	CN	Description
3.742	78	Meadow, non-grazed, HSG D
0.001	96	Gravel surface, HSG D
0.283	98	Water Surface, HSG D
4.026	79	Weighted Average
3.743		92.97% Pervious Area
0.283		7.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.6	100	0.0118	0.10		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.61"
2.0	178	0.0428	1.45		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
18.6	278	Total			

Subcatchment PDA-2A: PDA-2A



Summary for Subcatchment PDA-2B: PDA-2B

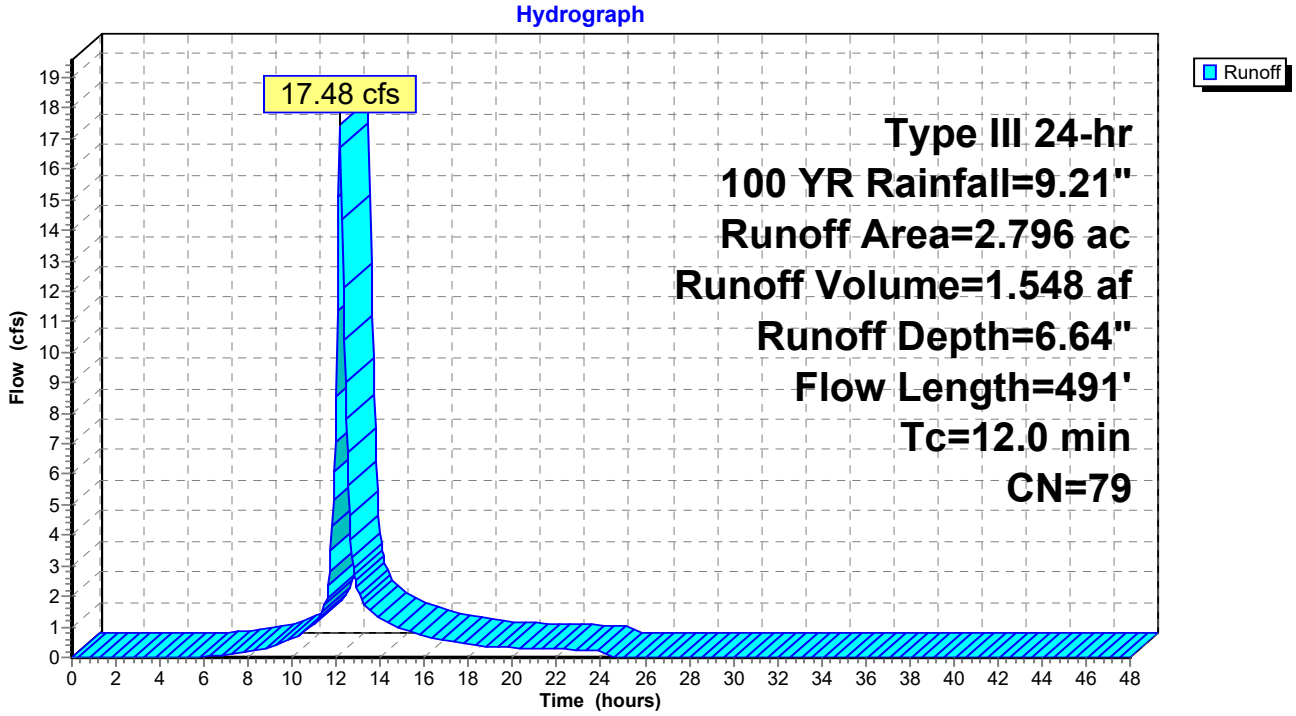
Runoff = 17.48 cfs @ 12.16 hrs, Volume= 1.548 af, Depth= 6.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=9.21"

Area (ac)	CN	Description
2.633	78	Meadow, non-grazed, HSG D
0.163	96	Gravel surface, HSG D
2.796	79	Weighted Average
2.796		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	100	0.0590	0.19		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.61"
3.2	376	0.0774	1.95		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
0.1	15	0.2800	3.70		**Shallow Concentrated Flow, C-D** Short Grass Pasture Kv= 7.0 fps
12.0	491	Total			

Subcatchment PDA-2B: PDA-2B



Summary for Subcatchment PDA-2C: PDA-2C

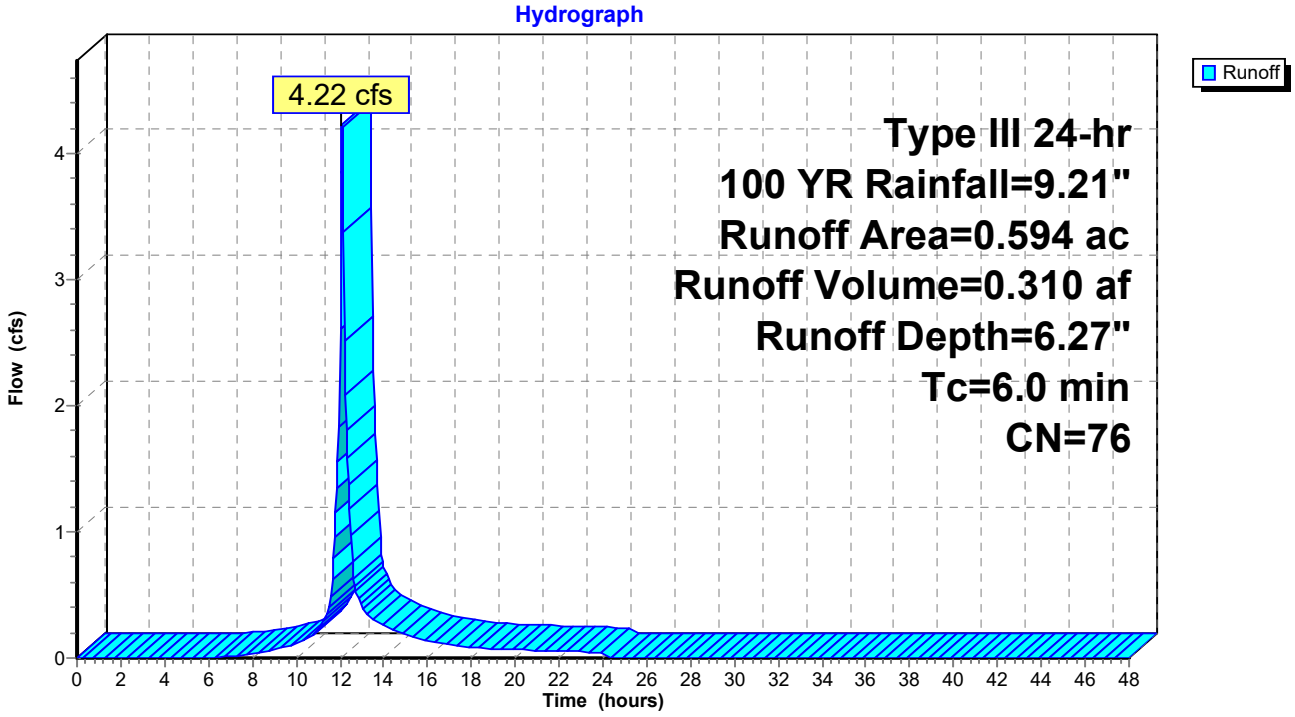
Runoff = 4.22 cfs @ 12.09 hrs, Volume= 0.310 af, Depth= 6.27"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=9.21"

Area (ac)	CN	Description
0.156	71	Meadow, non-grazed, HSG C
0.438	78	Meadow, non-grazed, HSG D
0.594	76	Weighted Average
0.594		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment PDA-2C: PDA-2C



Summary for Subcatchment PDA-3: PDA-3

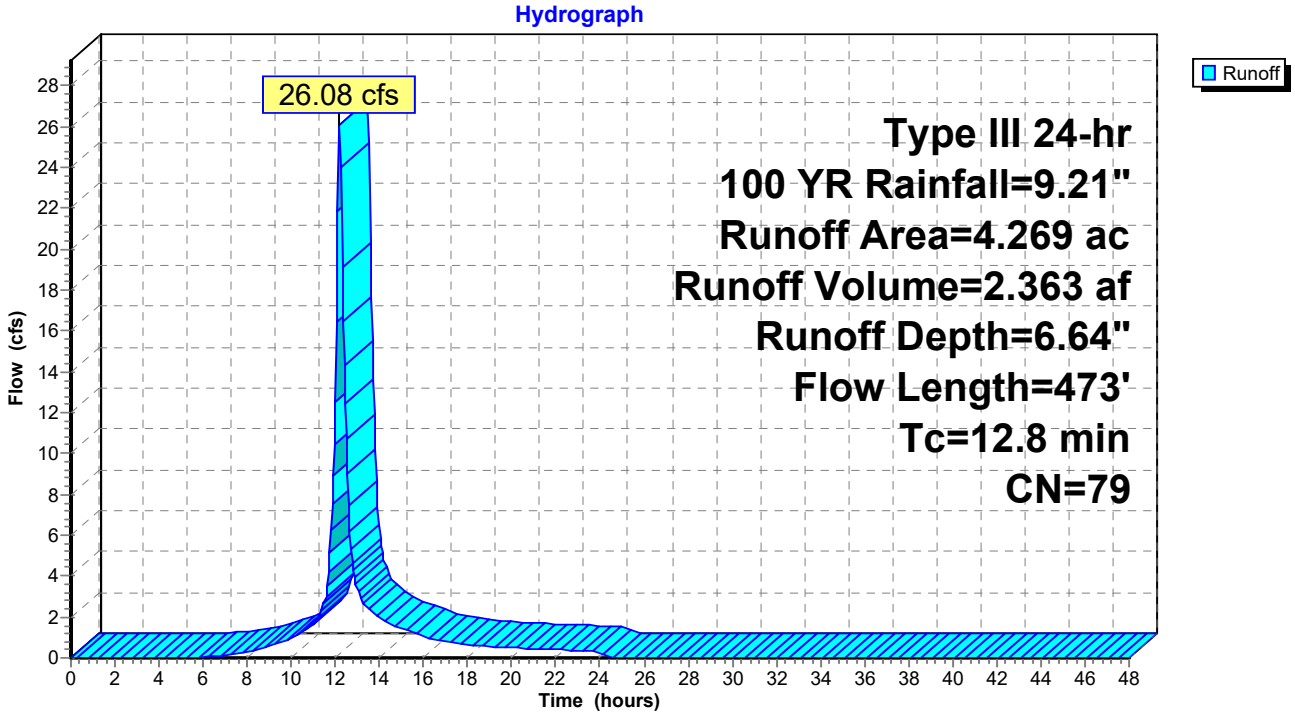
Runoff = 26.08 cfs @ 12.17 hrs, Volume= 2.363 af, Depth= 6.64"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type III 24-hr 100 YR Rainfall=9.21"

Area (ac)	CN	Description
4.134	78	Meadow, non-grazed, HSG D
0.135	98	Water Surface, HSG D
4.269	79	Weighted Average
4.134		96.84% Pervious Area
0.135		3.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.3	100	0.0503	0.18		**Sheet Flow, A-B** Grass: Dense n= 0.240 P2= 3.61"
3.5	373	0.0628	1.75		**Shallow Concentrated Flow, B-C** Short Grass Pasture Kv= 7.0 fps
12.8	473	Total			

Subcatchment PDA-3: PDA-3



Summary for Reach SW-2: SW-2

Inflow Area = 2.796 ac, 0.00% Impervious, Inflow Depth = 6.64" for 100 YR event
Inflow = 17.48 cfs @ 12.16 hrs, Volume= 1.548 af
Outflow = 17.23 cfs @ 12.18 hrs, Volume= 1.548 af, Atten= 1%, Lag= 1.2 min

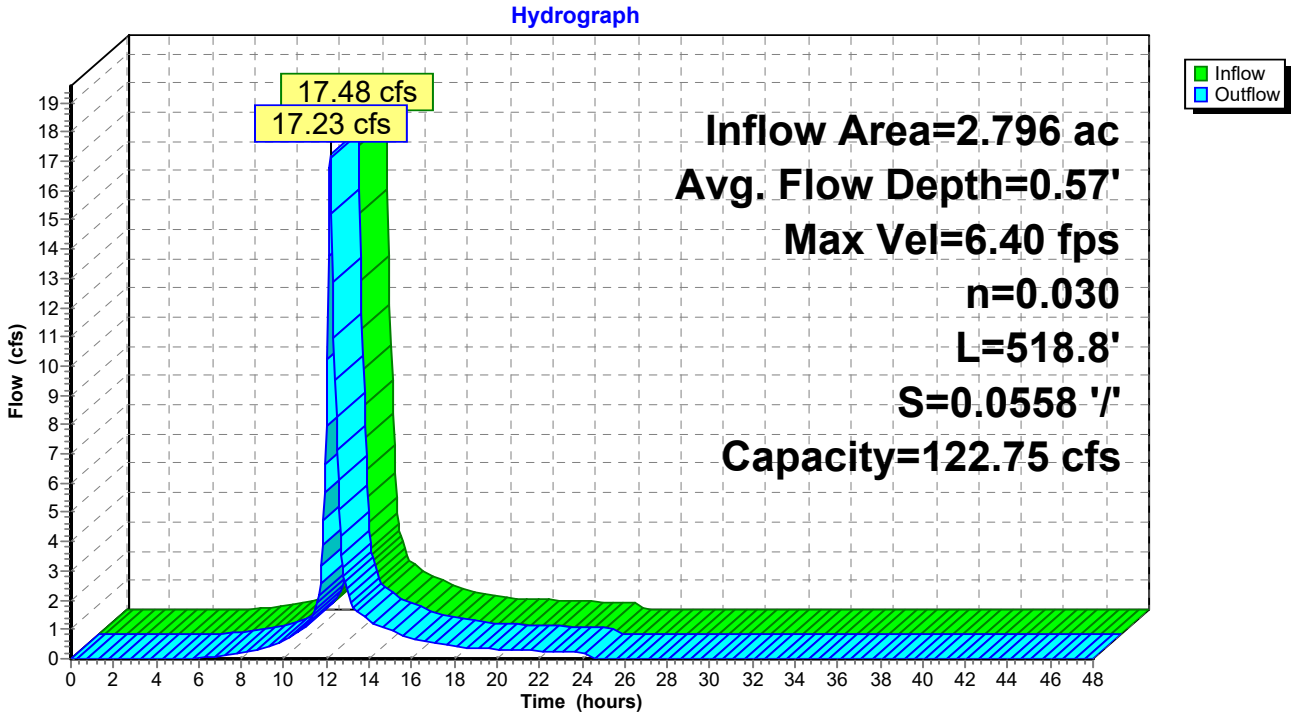
Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Max. Velocity= 6.40 fps, Min. Travel Time= 1.4 min
Avg. Velocity = 1.98 fps, Avg. Travel Time= 4.4 min

Peak Storage= 1,393 cf @ 12.18 hrs
Average Depth at Peak Storage= 0.57'
Bank-Full Depth= 1.50' Flow Area= 11.3 sf, Capacity= 122.75 cfs

3.00' x 1.50' deep channel, n= 0.030 Earth, grassed & winding
Side Slope Z-value= 3.0 '/' Top Width= 12.00'
Length= 518.8' Slope= 0.0558 '/'
Inlet Invert= 753.93', Outlet Invert= 725.00'

‡

Reach SW-2: SW-2



Summary for Pond B-1A: B-1A

Inflow Area = 3.636 ac, 0.00% Impervious, Inflow Depth = 6.39" for 100 YR event
Inflow = 17.28 cfs @ 12.31 hrs, Volume= 1.938 af
Outflow = 14.46 cfs @ 12.46 hrs, Volume= 1.937 af, Atten= 16%, Lag= 9.0 min
Primary = 14.46 cfs @ 12.46 hrs, Volume= 1.937 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Peak Elev= 699.93' @ 12.46 hrs Surf.Area= 5,670 sf Storage= 12,968 cf

Plug-Flow detention time= 24.8 min calculated for 1.937 af (100% of inflow)
Center-of-Mass det. time= 24.4 min (844.0 - 819.6)

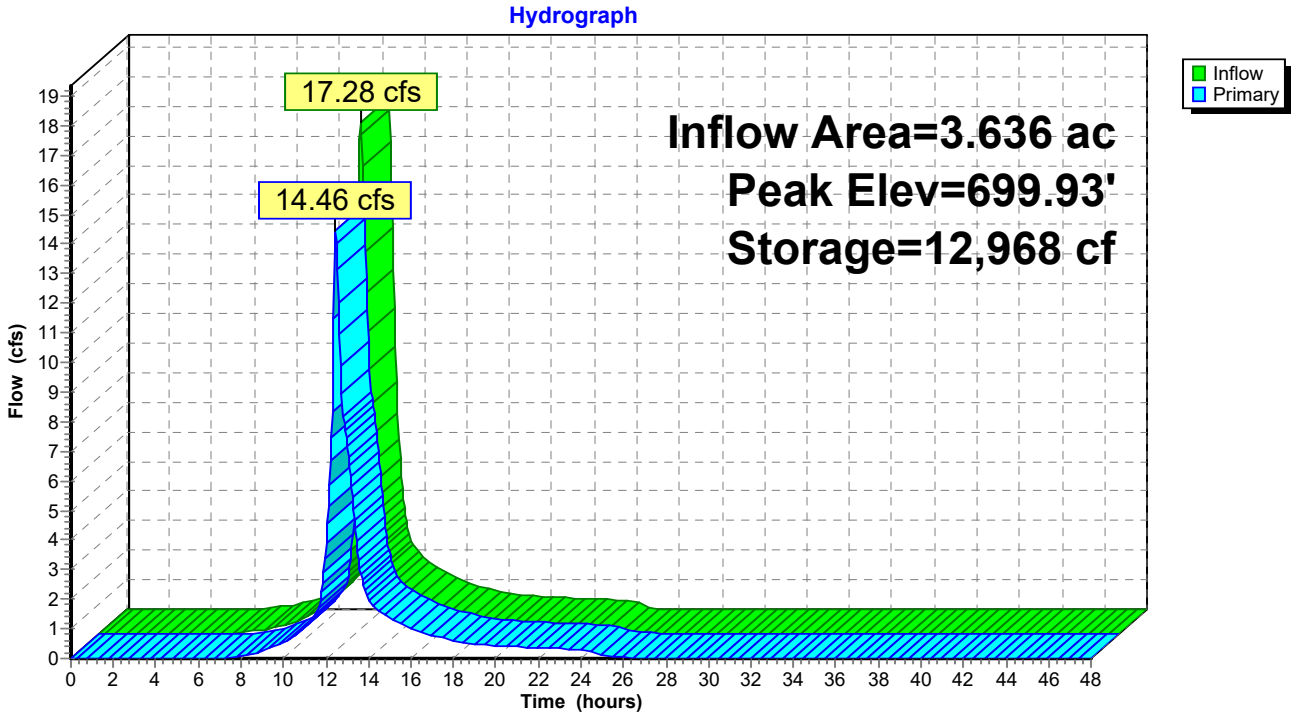
Volume	Invert	Avail.Storage	Storage Description
#1	697.00'	19,586 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
697.00	3,276	245.1	0	0	3,276
698.00	4,040	264.0	3,651	3,651	4,083
699.00	4,860	282.8	4,444	8,095	4,945
700.00	5,737	301.7	5,292	13,387	5,872
701.00	6,671	320.5	6,198	19,586	6,853

Device	Routing	Invert	Outlet Devices
#1	Primary	697.00'	**15.0" Round Culvert** L= 31.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 697.00' / 696.00' S= 0.0323 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Primary	699.50'	**7.5' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=14.41 cfs @ 12.46 hrs HW=699.92' TW=0.00' (Dynamic Tailwater)
1=Culvert (Inlet Controls 8.96 cfs @ 7.30 fps)
2=Broad-Crested Rectangular Weir (Weir Controls 5.45 cfs @ 1.71 fps)

Pond B-1A: B-1A


Hydrograph
17.28 cfs
14.46 cfs
Inflow Area=3.636 ac
Peak Elev=699.93'
Storage=12,968 cf
Inflow
Primary
Flow (cfs)
Time (hours)

Summary for Pond B-1B: B-1B

Inflow Area = 2.472 ac, 6.88% Impervious, Inflow Depth = 6.64" for 100 YR event
Inflow = 12.39 cfs @ 12.29 hrs, Volume= 1.369 af
Outflow = 7.63 cfs @ 12.56 hrs, Volume= 1.368 af, Atten= 38%, Lag= 16.2 min
Primary = 7.63 cfs @ 12.56 hrs, Volume= 1.368 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Starting Elev= 699.40' Surf.Area= 7,385 sf Storage= 8,704 cf
Peak Elev= 701.00' @ 12.56 hrs Surf.Area= 10,598 sf Storage= 23,066 cf (14,362 cf above start)

Plug-Flow detention time= 154.8 min calculated for 1.167 af (85% of inflow)
Center-of-Mass det. time= 59.3 min (873.5 - 814.2)

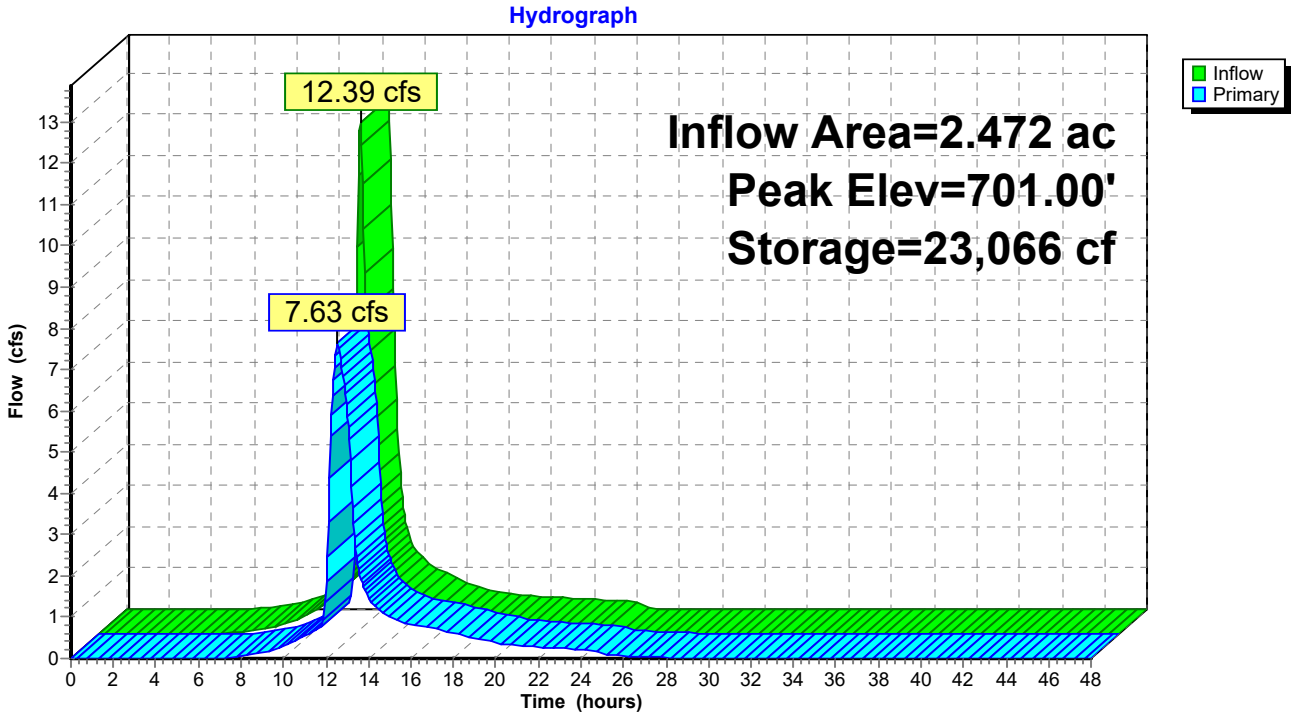
Volume	Invert	Avail.Storage	Storage Description
#1	698.00'	34,674 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
698.00	5,187	405.1	0	0	5,187
699.00	6,643	578.3	5,900	5,900	18,750
700.00	8,572	665.1	7,587	13,487	27,361
701.00	10,596	684.0	9,566	23,053	29,499
702.00	12,676	702.8	11,620	34,674	31,687

Device	Routing	Invert	Outlet Devices
#1	Primary	698.00'	**15.0" Round Culvert** L= 30.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 698.00' / 697.00' S= 0.0333 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 1.23 sf
#2	Device 1	699.40'	**12.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	700.00'	**15.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	700.90'	**3.0' long x 15.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=7.63 cfs @ 12.56 hrs HW=701.00' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 7.37 cfs of 9.11 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 1.46 cfs @ 5.85 fps)
  - **3=Orifice/Grate** (Orifice Controls 5.91 cfs @ 4.82 fps)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 0.25 cfs @ 0.85 fps)

Pond B-1B: B-1B


Hydrograph
12.39 cfs
7.63 cfs
Inflow Area=2.472 ac
Peak Elev=701.00'
Storage=23,066 cf
Inflow
Primary
Flow (cfs)
Time (hours)
0 1 2 3 4 5 6 7 8 9 10 11 12 13
0 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48

Summary for Pond B-2: B-2

Inflow Area = 6.822 ac, 4.15% Impervious, Inflow Depth = 6.64" for 100 YR event
Inflow = 37.71 cfs @ 12.21 hrs, Volume= 3.777 af
Outflow = 33.04 cfs @ 12.31 hrs, Volume= 3.775 af, Atten= 12%, Lag= 5.9 min
Primary = 33.04 cfs @ 12.31 hrs, Volume= 3.775 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Starting Elev= 721.85' Surf.Area= 12,337 sf Storage= 9,974 cf
Peak Elev= 723.96' @ 12.31 hrs Surf.Area= 15,497 sf Storage= 39,323 cf (29,349 cf above start)

Plug-Flow detention time= 121.7 min calculated for 3.542 af (94% of inflow)
Center-of-Mass det. time= 73.3 min (883.6 - 810.3)

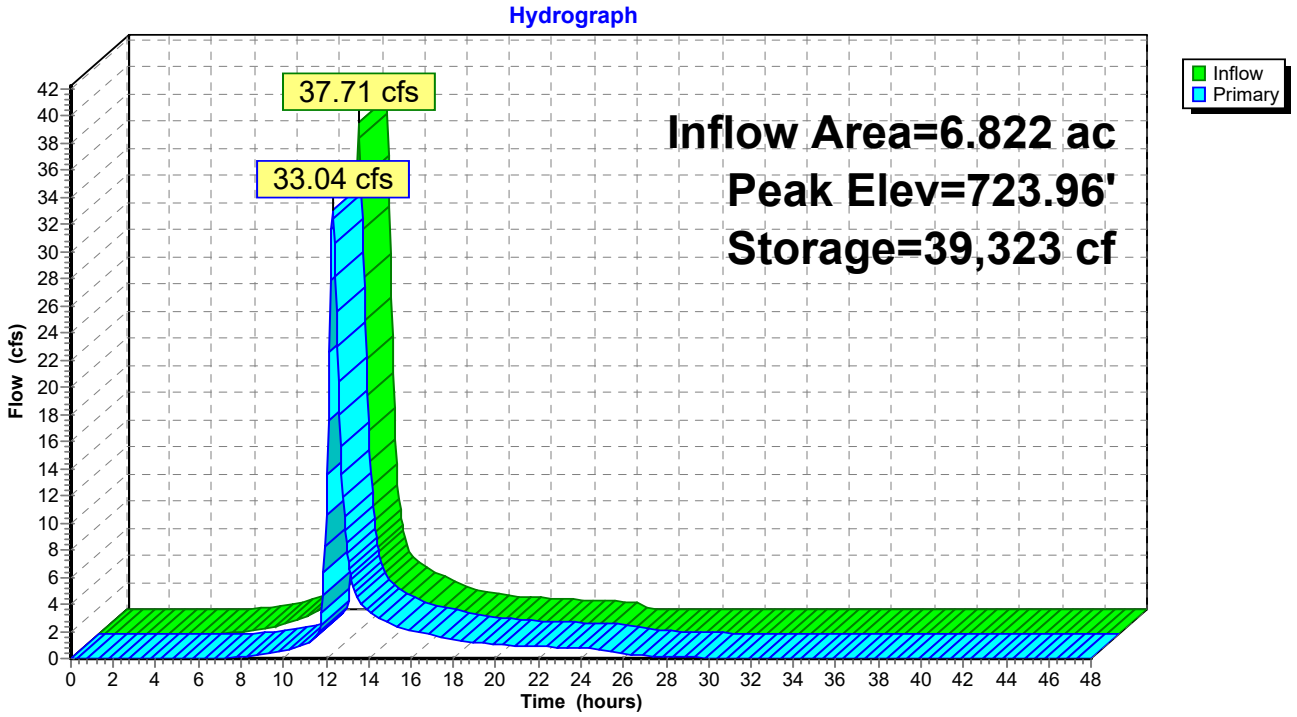
Volume	Invert	Avail.Storage	Storage Description
#1	721.00'	56,252 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
721.00	11,140	462.4	0	0	11,140
722.00	12,555	481.2	11,840	11,840	12,628
723.00	14,027	500.1	13,284	25,125	14,184
724.00	15,556	518.9	14,785	39,910	15,791
725.00	17,141	537.8	16,342	56,252	17,466

Device	Routing	Invert	Outlet Devices
#1	Primary	720.50'	**12.0" Round Culvert** L= 34.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 720.50' / 720.00' S= 0.0147 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Device 1	721.85'	**12.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	722.50'	**12.0" Vert. Orifice/Grate** C= 0.600
#4	Primary	723.00'	**11.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=32.88 cfs @ 12.31 hrs HW=723.96' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 5.40 cfs of 6.50 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 1.70 cfs @ 6.78 fps)
  - **3=Orifice/Grate** (Orifice Controls 3.70 cfs @ 4.71 fps)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 27.48 cfs @ 2.61 fps)

Pond B-2: B-2


Hydrograph
37.71 cfs
33.04 cfs
Inflow Area=6.822 ac
Peak Elev=723.96'
Storage=39,323 cf
Inflow
Primary
Flow (cfs)
Time (hours)

Summary for Pond B-3: B-3

Inflow Area = 4.269 ac, 3.16% Impervious, Inflow Depth = 6.64" for 100 YR event
Inflow = 26.08 cfs @ 12.17 hrs, Volume= 2.363 af
Outflow = 23.40 cfs @ 12.24 hrs, Volume= 2.363 af, Atten= 10%, Lag= 4.2 min
Primary = 23.40 cfs @ 12.24 hrs, Volume= 2.363 af

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Starting Elev= 736.05' Surf.Area= 5,881 sf Storage= 5,653 cf
Peak Elev= 737.87' @ 12.24 hrs Surf.Area= 7,731 sf Storage= 18,030 cf (12,377 cf above start)

Plug-Flow detention time= 77.1 min calculated for 2.233 af (95% of inflow)
Center-of-Mass det. time= 31.6 min (837.9 - 806.3)

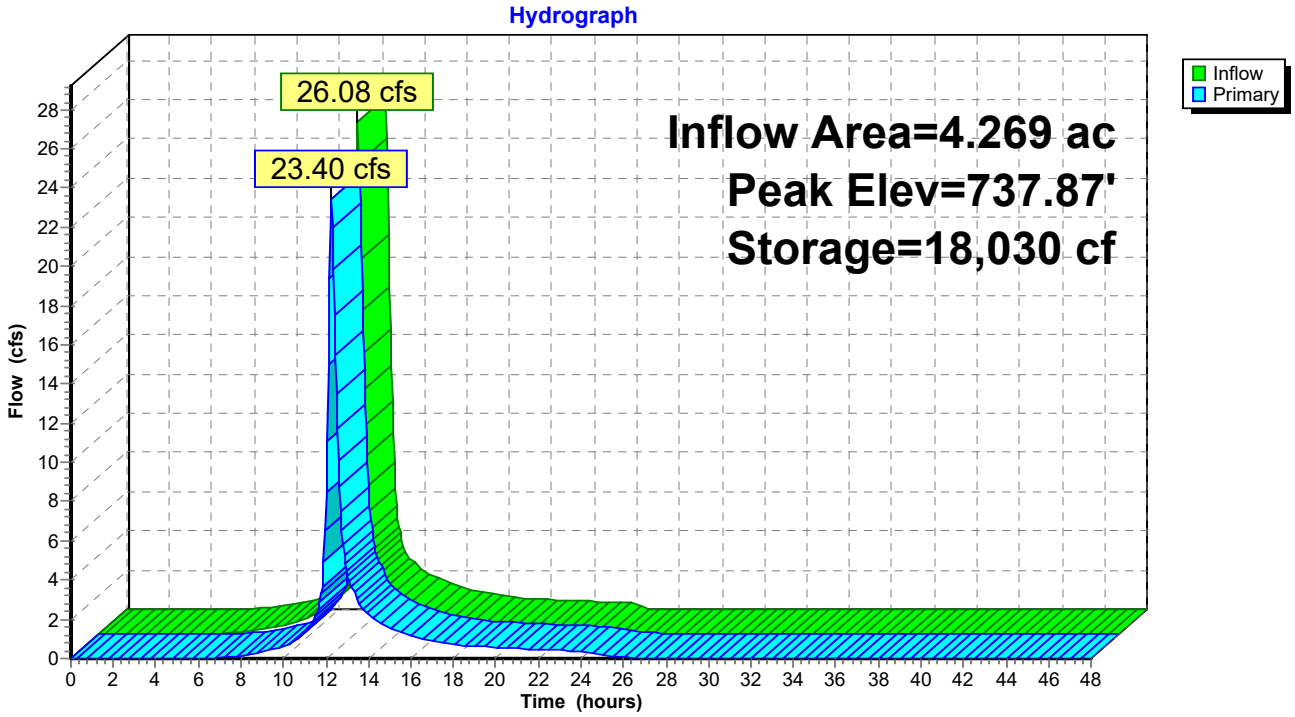
Volume	Invert	Avail.Storage	Storage Description
#1	735.00'	27,433 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
735.00	4,900	301.5	0	0	4,900
736.00	5,833	320.3	5,360	5,360	5,881
737.00	6,822	339.2	6,321	11,681	6,926
738.00	7,868	358.0	7,339	19,020	8,026
739.00	8,971	376.9	8,413	27,433	9,191

Device	Routing	Invert	Outlet Devices
#1	Primary	735.50'	**12.0" Round Culvert** L= 28.0' CPP, square edge headwall, Ke= 0.500 Inlet / Outlet Invert= 735.50' / 735.00' S= 0.0179 '/' Cc= 0.900 n= 0.013 Corrugated PE, smooth interior, Flow Area= 0.79 sf
#2	Primary	736.05'	**12.0" W x 3.0" H Vert. Orifice/Grate** C= 0.600
#3	Device 1	736.50'	**12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#4	Primary	737.00'	**8.0' long x 12.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.57 2.62 2.70 2.67 2.66 2.67 2.66 2.64

Primary OutFlow Max=23.27 cfs @ 12.24 hrs HW=737.87' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 4.42 cfs of 5.17 cfs potential flow)
  - **3=Orifice/Grate** (Orifice Controls 4.42 cfs @ 5.63 fps)
- **2=Orifice/Grate** (Orifice Controls 1.57 cfs @ 6.27 fps)
- **4=Broad-Crested Rectangular Weir** (Weir Controls 17.28 cfs @ 2.49 fps)

Pond B-3: B-3

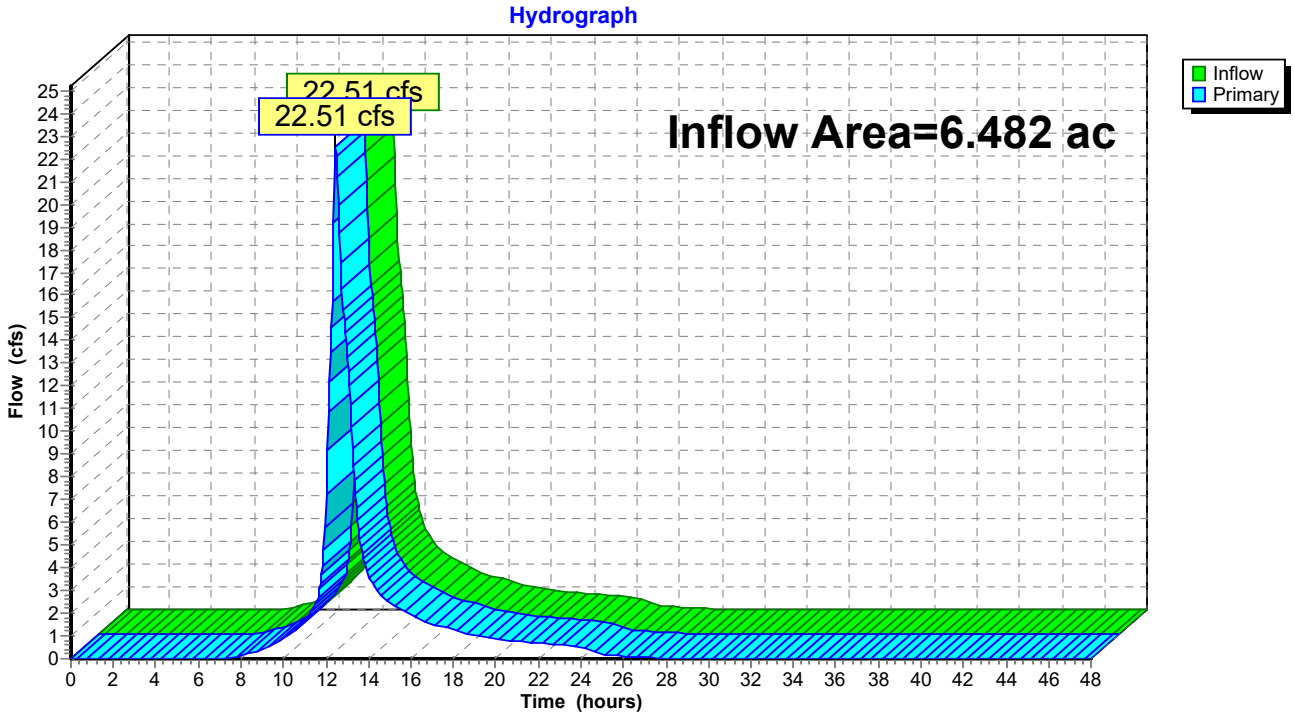

Hydrograph
26.08 cfs
23.40 cfs
Inflow Area=4.269 ac
Peak Elev=737.87'
Storage=18,030 cf
Inflow
Primary
Flow (cfs)
Time (hours)

Summary for Link AP-1: AP-1

Inflow Area = 6.482 ac, 2.62% Impervious, Inflow Depth = 6.44" for 100 YR event
Inflow = 22.51 cfs @ 12.46 hrs, Volume= 3.481 af
Primary = 22.51 cfs @ 12.46 hrs, Volume= 3.481 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link AP-1: AP-1

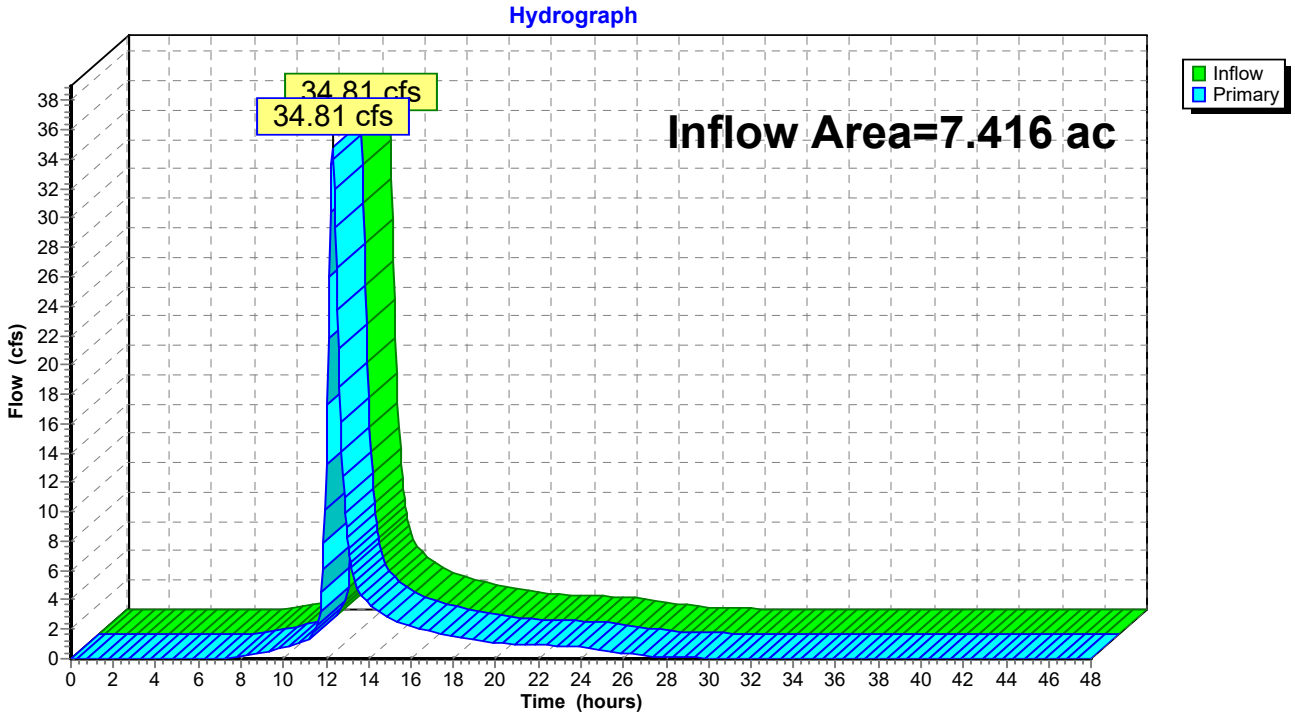


Summary for Link AP-2: AP-2

Inflow Area = 7.416 ac, 3.82% Impervious, Inflow Depth = 6.61" for 100 YR event
Inflow = 34.81 cfs @ 12.30 hrs, Volume= 4.085 af
Primary = 34.81 cfs @ 12.30 hrs, Volume= 4.085 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link AP-2: AP-2

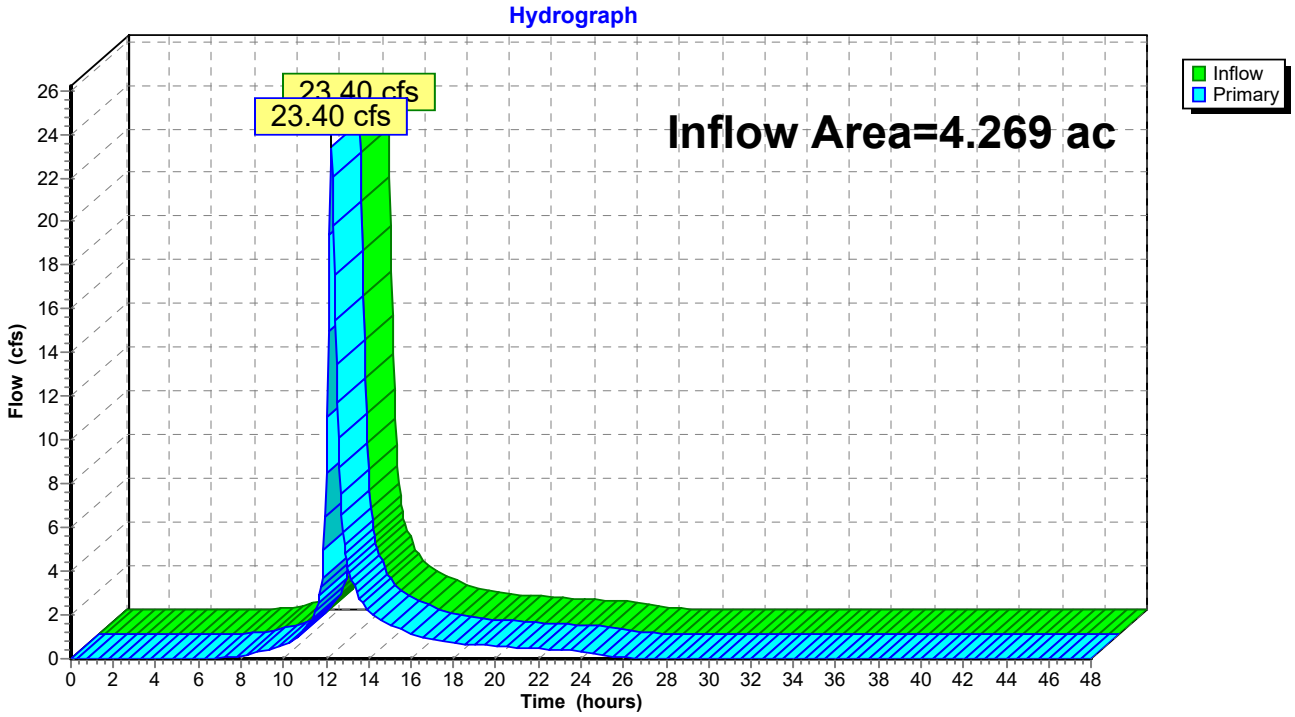


Summary for Link AP-3: AP-3

Inflow Area = 4.269 ac, 3.16% Impervious, Inflow Depth = 6.64" for 100 YR event
Inflow = 23.40 cfs @ 12.24 hrs, Volume= 2.363 af
Primary = 23.40 cfs @ 12.24 hrs, Volume= 2.363 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link AP-3: AP-3



APPENDIX D: NOAA ATLAS 14 PRECIPITATION FREQUENCY TABLE

NOAA Atlas 14, Volume 10, Version 3
Location name: Bristol, Connecticut, USA*
Latitude: 41.691°, Longitude: -72.9783°
Elevation: 757.75 ft**
* source: ESRI Maps
** source: USGS

POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Sandra Pavlovic, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Orlan Wilhite

NOAA, National Weather Service, Silver Spring, Maryland

PF_tabular | PF_graphical | Maps_&_aerials

PF tabular

PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches)[1]

Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.366 (0.278-0.481)	0.436 (0.331-0.574)	0.550 (0.416-0.726)	0.645 (0.486-0.856)	0.775 (0.567-1.07)	0.874 (0.627-1.23)	0.976 (0.682-1.42)	1.09 (0.726-1.62)	1.23 (0.798-1.91)	1.35 (0.855-2.13)
10-min	0.519 (0.394-0.682)	0.618 (0.469-0.813)	0.780 (0.590-1.03)	0.914 (0.688-1.21)	1.10 (0.803-1.52)	1.24 (0.888-1.74)	1.38 (0.966-2.01)	1.54 (1.03-2.30)	1.75 (1.13-2.70)	1.92 (1.21-3.02)
15-min	0.610 (0.464-0.802)	0.727 (0.551-0.956)	0.917 (0.694-1.21)	1.08 (0.809-1.43)	1.29 (0.945-1.78)	1.46 (1.05-2.05)	1.63 (1.14-2.37)	1.81 (1.21-2.70)	2.06 (1.33-3.18)	2.25 (1.43-3.55)
30-min	0.826 (0.627-1.09)	0.983 (0.746-1.29)	1.24 (0.938-1.64)	1.45 (1.10-1.93)	1.75 (1.28-2.41)	1.97 (1.42-2.78)	2.20 (1.54-3.20)	2.45 (1.64-3.66)	2.79 (1.80-4.31)	3.05 (1.93-4.81)
60-min	1.04 (0.791-1.37)	1.24 (0.941-1.63)	1.57 (1.18-2.07)	1.83 (1.38-2.43)	2.21 (1.61-3.04)	2.49 (1.79-3.50)	2.78 (1.94-4.04)	3.09 (2.07-4.61)	3.51 (2.27-5.43)	3.85 (2.44-6.07)
2-hr	1.37 (1.04-1.79)	1.61 (1.23-2.11)	2.02 (1.53-2.65)	2.35 (1.78-3.10)	2.81 (2.06-3.86)	3.16 (2.27-4.42)	3.51 (2.46-5.09)	3.90 (2.62-5.80)	4.42 (2.87-6.81)	4.84 (3.07-7.61)
3-hr	1.59 (1.22-2.07)	1.88 (1.43-2.44)	2.34 (1.79-3.07)	2.73 (2.07-3.59)	3.27 (2.40-4.47)	3.67 (2.65-5.13)	4.09 (2.88-5.92)	4.54 (3.06-6.75)	5.18 (3.37-7.96)	5.69 (3.62-8.92)
6-hr	2.01 (1.55-2.61)	2.40 (1.84-3.12)	3.04 (2.33-3.96)	3.57 (2.72-4.68)	4.30 (3.19-5.89)	4.85 (3.53-6.78)	5.43 (3.85-7.88)	6.09 (4.11-9.02)	7.05 (4.60-10.8)	7.85 (5.01-12.3)
12-hr	2.48 (1.91-3.19)	3.02 (2.33-3.90)	3.92 (3.01-5.07)	4.66 (3.56-6.06)	5.68 (4.23-7.76)	6.43 (4.72-9.01)	7.25 (5.21-10.6)	8.25 (5.57-12.2)	9.77 (6.38-14.9)	11.1 (7.08-17.3)
24-hr	2.89 (2.24-3.70)	3.61 (2.79-4.63)	4.80 (3.70-6.17)	5.78 (4.43-7.47)	7.13 (5.35-9.74)	8.12 (6.00-11.4)	9.21 (6.70-13.5)	10.6 (7.19-15.6)	12.8 (8.40-19.6)	14.8 (9.50-23.0)
2-day	3.23 (2.51-4.12)	4.12 (3.20-5.25)	5.57 (4.32-7.13)	6.78 (5.22-8.72)	8.44 (6.37-11.5)	9.64 (7.19-13.5)	11.0 (8.09-16.2)	12.8 (8.69-18.8)	15.8 (10.4-24.0)	18.5 (11.9-28.6)
3-day	3.51 (2.74-4.45)	4.49 (3.50-5.70)	6.09 (4.73-7.77)	7.42 (5.73-9.52)	9.25 (7.01-12.6)	10.6 (7.91-14.8)	12.1 (8.92-17.8)	14.1 (9.58-20.6)	17.5 (11.5-26.5)	20.5 (13.2-31.6)
4-day	3.77 (2.94-4.77)	4.81 (3.76-6.10)	6.52 (5.07-8.30)	7.94 (6.14-10.2)	9.89 (7.51-13.5)	11.3 (8.47-15.8)	12.9 (9.55-19.0)	15.1 (10.3-22.0)	18.7 (12.3-28.3)	21.9 (14.1-33.8)
7-day	4.50 (3.52-5.66)	5.67 (4.44-7.15)	7.59 (5.92-9.61)	9.18 (7.13-11.7)	11.4 (8.65-15.4)	13.0 (9.73-18.0)	14.8 (10.9-21.6)	17.1 (11.7-25.0)	21.1 (13.9-31.8)	24.6 (15.9-37.8)
10-day	5.23 (4.11-6.57)	6.47 (5.07-8.13)	8.49 (6.64-10.7)	10.2 (7.91-12.9)	12.5 (9.49-16.8)	14.1 (10.6-19.6)	16.0 (11.8-23.3)	18.5 (12.7-26.9)	22.5 (14.9-33.9)	26.1 (16.9-40.0)
20-day	7.55 (5.96-9.43)	8.83 (6.96-11.0)	10.9 (8.58-13.7)	12.7 (9.89-16.0)	15.0 (11.5-20.0)	16.8 (12.6-22.9)	18.7 (13.8-26.8)	21.2 (14.6-30.6)	24.9 (16.6-37.4)	28.3 (18.4-43.3)
30-day	9.48 (7.50-11.8)	10.8 (8.51-13.4)	12.9 (10.1-16.1)	14.6 (11.5-18.4)	17.0 (13.0-22.5)	18.8 (14.1-25.4)	20.7 (15.2-29.3)	23.0 (15.9-33.2)	26.5 (17.6-39.6)	29.4 (19.2-45.0)
45-day	11.8 (9.38-14.7)	13.2 (10.4-16.3)	15.3 (12.1-19.1)	17.1 (13.4-21.4)	19.5 (14.9-25.6)	21.4 (16.0-28.6)	23.3 (16.9-32.4)	25.4 (17.6-36.5)	28.4 (19.0-42.3)	30.8 (20.1-47.0)
60-day	13.8 (10.9-17.0)	15.1 (12.0-18.7)	17.4 (13.7-21.6)	19.2 (15.1-24.0)	21.7 (16.6-28.2)	23.7 (17.7-31.5)	25.6 (18.5-35.2)	27.6 (19.2-39.4)	30.1 (20.2-44.8)	32.0 (20.9-48.8)

[1] Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).

Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.

Please refer to NOAA Atlas 14 document for more information.

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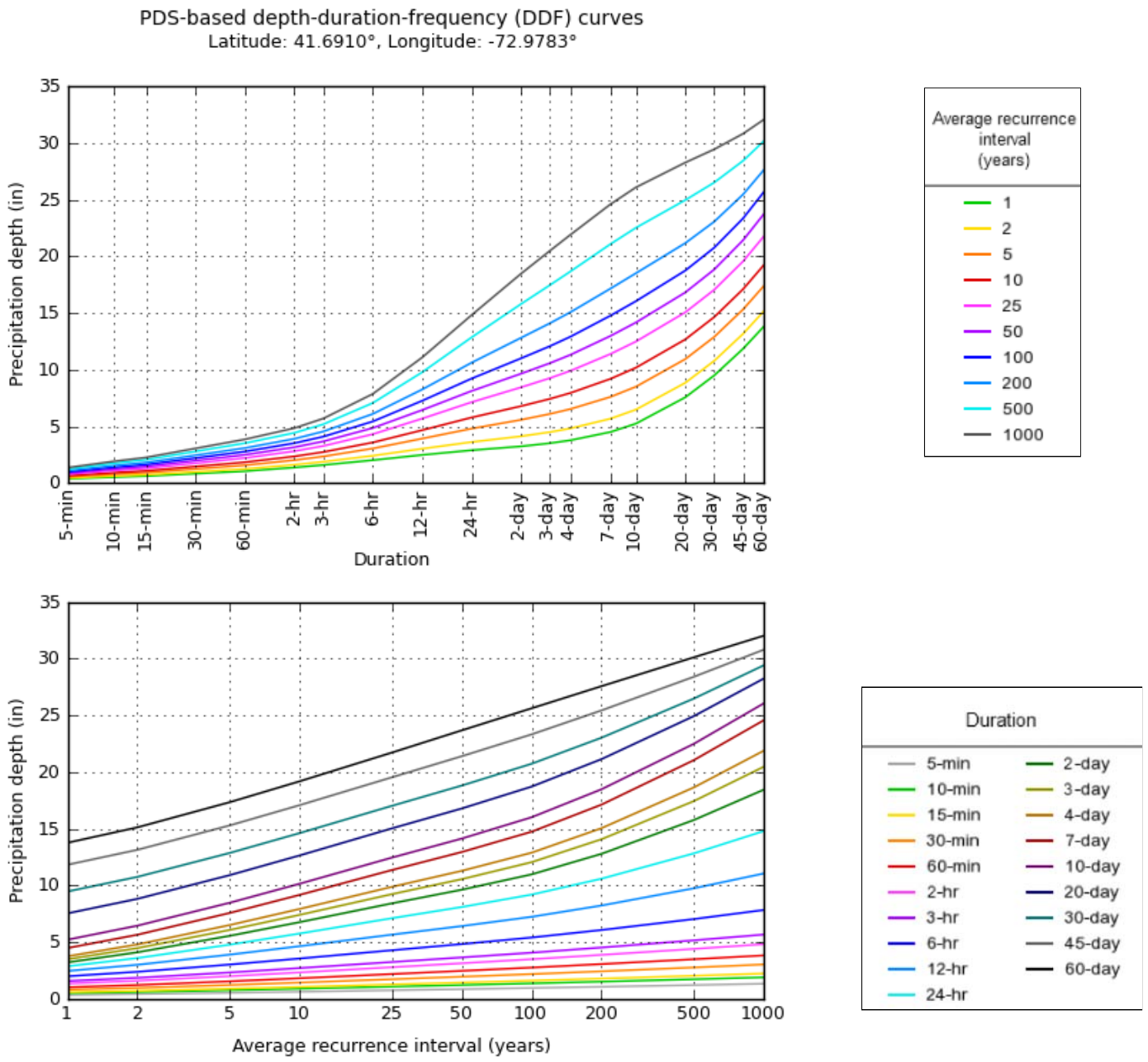
PF graphical



NOAA Atlas 14, Volume 10, Version 3

Created (GMT): Thu May 30 16:24:34 2019

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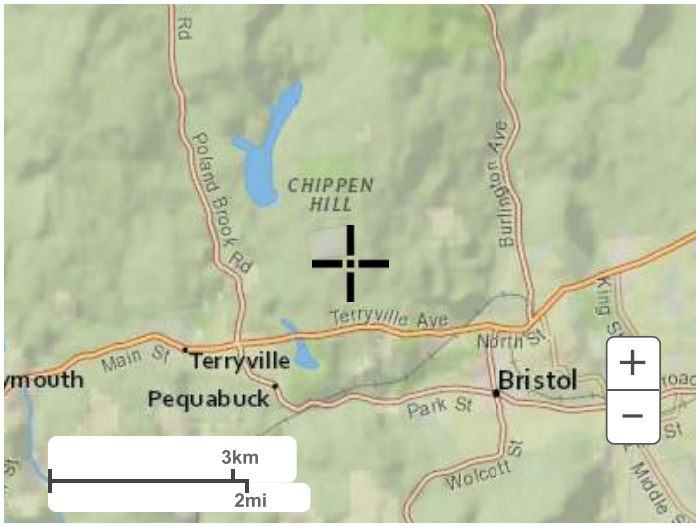
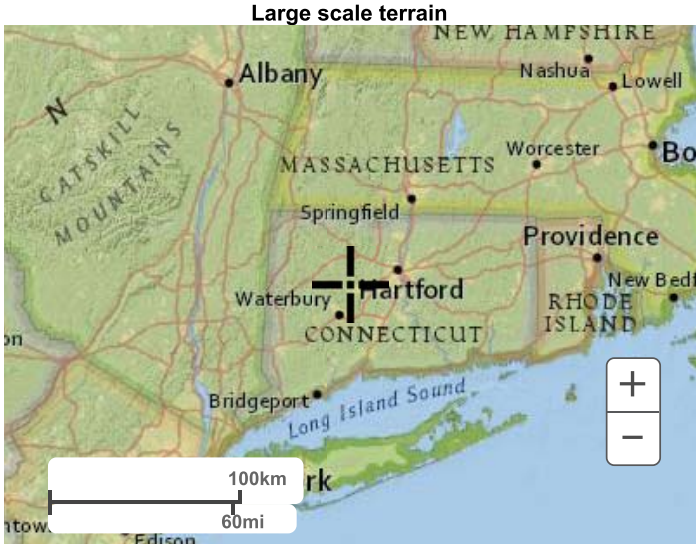
Maps & aerials

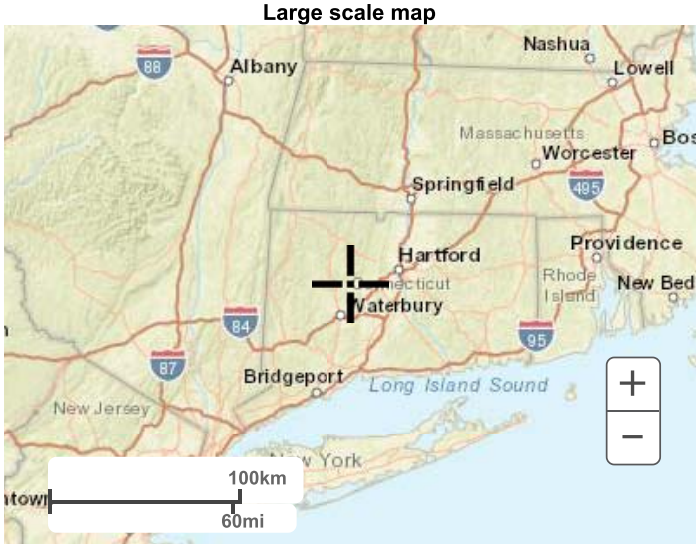
Small scale terrain



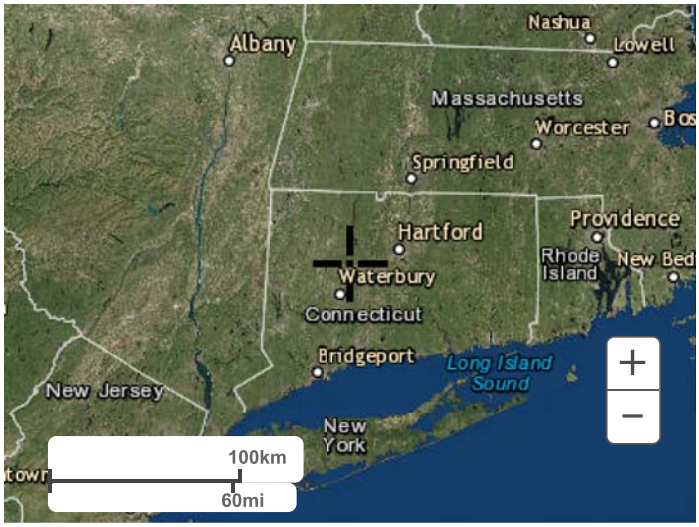
Large scale terrain



Large scale map



Large scale aerial



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US Department of Commerce
National Oceanic and Atmospheric Administration
National Weather Service
National Water Center
1325 East West Highway
Silver Spring, MD 20910
Questions?: HDSC.Questions@noaa.gov

Disclaimer

APPENDIX E: WATER QUALITY VOLUME CALCULATIONS

WATER QUALITY VOLUME CALCULATIONS
FOR
BRISTOL SOLAR ONE, LLC
311 HILL STREET, BRISTOL, CT

$$WQV = \frac{(1")(R)(A)}{12}$$

where: WQV = water quality volume (ac-ft)
R = volumetric runoff coefficient = 0.05+0.009(I)
I = percent impervious cover
A = site area in acres

$V=WQV+((P)(A_b)/12)$

V=required basin storage volume (ac-ft)
WQV=Water Quality Volume (ac-ft)
P= design water quality precipitation (in)
A_b=basin surface area (ac)

	Area (ac)	Pervious (ac)	Imperv. (ac)	I	R	WQV (ac-ft)	P (in)	Ab (ac)	V (ac-ft)	Total V Req. (cf)	V Provided (cf)
Overall Site	17.20	12.02	5.18	30%	0.32	0.46	n/a	n/a	n/a	20,056.31	-
Basin 1-A	3.64	2.44	1.20	33%	0.35	0.11	1	0.266531	0.13	5,547.58	-
Basin 1-B	2.47	2.00	0.47	19%	0.22	0.05	1	0.266531	0.07	2,948.62	8,704.00
Basin 2	6.82	4.50	2.32	34%	0.36	0.20	1	0.266531	0.22	9,782.10	9,974.00
Basin 3	4.27	3.07	1.20	28%	0.30	0.11	1	0.266531	0.13	5,648.04	5,653.00
Overall Basins	17.20	12.02	5.18	30%	0.32	0.46	1	0.266531	0.48	21,023.82	-

Overal Total V Required = 21,023.82 cf
Overal Total V Provided = 24,331.00 cf

Stage-Area-Storage for Pond B-1A: B-1A

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
697.00	3,276	0
697.05	3,312	165
697.10	3,349	331
697.15	3,385	500
697.20	3,422	670
697.25	3,459	842
697.30	3,497	1,016
697.35	3,534	1,192
697.40	3,572	1,369
697.45	3,610	1,549
697.50	3,648	1,730
697.55	3,686	1,914
697.60	3,725	2,099
697.65	3,763	2,286
697.70	3,802	2,475
697.75	3,841	2,666
697.80	3,881	2,859
697.85	3,920	3,054
697.90	3,960	3,251
697.95	4,000	3,450
698.00	4,040	3,651
698.05	4,079	3,854
698.10	4,119	4,059
698.15	4,158	4,266
698.20	4,198	4,475
698.25	4,238	4,686
698.30	4,278	4,899
698.35	4,318	5,114
698.40	4,359	5,331
698.45	4,400	5,550
698.50	4,441	5,771
TSB-1A — 698.55	4,482	5,994
698.60	4,523	6,219
698.65	4,564	6,446
698.70	4,606	6,675
698.75	4,648	6,907
698.80	4,690	7,140
698.85	4,732	7,376
698.90	4,775	7,613
698.95	4,817	7,853
699.00	4,860	8,095
699.05	4,902	8,339
699.10	4,944	8,585
699.15	4,987	8,834
699.20	5,030	9,084
699.25	5,072	9,336
699.30	5,115	9,591
699.35	5,159	9,848
699.40	5,202	10,107
699.45	5,246	10,368
TSB-1A — 699.50	5,289	10,632
699.55	5,333	10,897
699.60	5,377	11,165

WET VOLUME ELEVATION

DRY VOLUME ELEVATION

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
699.65	5,422	11,435
699.70	5,466	11,707
699.75	5,511	11,982
699.80	5,556	12,258
699.85	5,601	12,537
699.90	5,646	12,818
699.95	5,691	13,102
700.00	5,737	13,387
700.05	5,782	13,675
700.10	5,827	13,966
700.15	5,873	14,258
700.20	5,918	14,553
700.25	5,964	14,850
700.30	6,010	15,149
700.35	6,056	15,451
700.40	6,102	15,755
700.45	6,149	16,061
700.50	6,195	16,370
700.55	6,242	16,681
700.60	6,289	16,994
700.65	6,336	17,310
700.70	6,383	17,628
700.75	6,431	17,948
700.80	6,479	18,271
700.85	6,526	18,596
700.90	6,574	18,923
700.95	6,623	19,253
701.00	**6,671**	**19,586**

Stage-Area-Storage for Pond B-1B: B-1B

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
698.00	5,187	0
698.05	5,256	261
698.10	5,325	526
698.15	5,394	794
698.20	5,464	1,065
698.25	5,534	1,340
698.30	5,605	1,618
698.35	5,676	1,900
698.40	5,748	2,186
698.45	5,820	2,475
698.50	5,893	2,768
698.55	5,966	3,064
698.60	6,039	3,365
698.65	6,113	3,668
698.70	6,187	3,976
698.75	6,262	4,287
698.80	6,337	4,602
698.85	6,413	4,921
698.90	6,489	5,243
698.95	6,566	5,570
699.00	6,643	5,900
699.05	6,734	6,234
699.10	6,825	6,573
699.15	6,917	6,917
699.20	7,009	7,265
699.25	7,102	7,618
699.30	7,196	7,975
699.35	7,290	8,337
699.40 — B-1B WQV ELEVATION & TSB-1B WET VOLUME ELEVATION	7,385	8,704
699.45	7,481	9,076
699.50	7,577	9,452
699.55	7,674	9,834
699.60	7,771	10,220
699.65	7,869	10,611
699.70	7,968	11,007
699.75	8,067	11,408
699.80	8,167	11,813
699.85	8,267	12,224
699.90	8,368	12,640
699.95	8,470	13,061
700.00	8,572	13,487
700.05	8,668	13,918
700.10	8,765	14,354
700.15	8,862	14,795
700.20	8,960	15,240
700.25	9,058	15,691
700.30	9,157	16,146
700.35	9,256	16,606
700.40	9,356	17,071
700.45	9,456	17,542
700.50	9,557	18,017
700.55	9,659	18,498
700.60	9,761	18,983

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
700.65	9,863	19,474
700.70	9,966	19,969
700.75	10,070	20,470
700.80	10,174	20,976
700.85	10,279	21,488
700.90 — TSB-1B DRY VOLUME ELEVATION	10,384	22,004
700.95	10,490	22,526
701.00	10,596	23,053
701.05	10,696	23,585
701.10	10,796	24,123
701.15	10,896	24,665
701.20	10,997	25,212
701.25	11,099	25,765
701.30	11,200	26,322
701.35	11,303	26,885
701.40	11,406	27,453
701.45	11,509	28,025
701.50	11,613	28,603
701.55	11,717	29,187
701.60	11,822	29,775
701.65	11,927	30,369
701.70	12,032	30,968
701.75	12,139	31,572
701.80	12,245	32,182
701.85	12,352	32,797
701.90	12,460	33,417
701.95	12,568	34,043
702.00	**12,676**	**34,674**

Stage-Area-Storage for Pond B-2: B-2

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
721.00	11,140	0
721.05	11,209	559
721.10	11,278	1,121
721.15	11,347	1,686
721.20	11,416	2,256
721.25	11,486	2,828
721.30	11,556	3,404
721.35	11,626	3,984
721.40	11,696	4,567
721.45	11,766	5,153
721.50	11,837	5,743
721.55	11,908	6,337
721.60	11,979	6,934
721.65	12,050	7,535
721.70	12,122	8,139
721.75	12,193	8,747
721.80	12,265	9,358
B-2 WQV - ELEVATION 721.85	12,337	9,974
721.90	12,410	10,592
TSB-2 WET VOLUME ELEVATION 721.95	12,482	11,215
722.00	12,555	11,840
722.05	12,627	12,470
722.10	12,699	13,103
722.15	12,771	13,740
722.20	12,843	14,380
722.25	12,915	15,024
722.30	12,988	15,672
722.35	13,061	16,323
722.40	13,134	16,978
722.45	13,207	17,636
722.50	13,281	18,299
722.55	13,355	18,964
722.60	13,428	19,634
722.65	13,503	20,307
722.70	13,577	20,984
722.75	13,651	21,665
722.80	13,726	22,349
722.85	13,801	23,038
722.90	13,876	23,730
722.95	13,951	24,425
TSB-2 DRY VOLUME ELEVATION 723.00	14,027	25,125
723.05	14,102	25,828
723.10	14,176	26,535
723.15	14,251	27,246
723.20	14,326	27,960
723.25	14,402	28,678
723.30	14,477	29,400
723.35	14,553	30,126
723.40	14,629	30,855
723.45	14,705	31,589
723.50	14,782	32,326
723.55	14,858	33,067
723.60	14,935	33,812
723.65	15,012	34,560
723.70	15,089	35,313
723.75	15,166	36,069
723.80	15,244	36,830
723.85	15,322	37,594
723.90	15,400	38,362
723.95	15,478	39,134
724.00	15,556	39,910
724.05	15,633	40,689
724.10	15,711	41,473
724.15	15,789	42,260
724.20	15,867	43,052
724.25	15,945	43,847
724.30	16,023	44,646
724.35	16,102	45,449
724.40	16,181	46,257
724.45	16,260	47,068
724.50	16,339	47,882
724.55	16,418	48,701
724.60	16,498	49,524
724.65	16,578	50,351
724.70	16,657	51,182
724.75	16,738	52,017
724.80	16,818	52,856
724.85	16,898	53,699
724.90	16,979	54,546
724.95	17,060	55,397
725.00	**17,141**	**56,252**

Stage-Area-Storage for Pond B-3: B-3

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
735.00	4,900	0
735.05	4,945	246
735.10	4,990	494
735.15	5,035	745
735.20	5,080	998
735.25	5,126	1,253
735.30	5,171	1,511
735.35	5,217	1,770
735.40	5,263	2,032
735.45	5,310	2,297
735.50	5,356	2,563
735.55	5,403	2,832
735.60	5,450	3,104
735.65	5,497	3,377
735.70	5,545	3,653
735.75	5,592	3,932
735.80	5,640	4,212
735.85	5,688	4,496
735.90	5,736	4,781
735.95	5,784	5,069
736.00	5,833	5,360
736.05	5,881	5,653
736.10	5,928	5,948
736.15	5,976	6,245
736.20	6,025	6,545
736.25	6,073	6,848
736.30	6,122	7,153
736.35	6,170	7,460
736.40	6,219	7,770
736.45	6,268	8,082
736.50	6,318	8,397
736.55	6,367	8,714
736.60	6,417	9,033
736.65	6,467	9,355
736.70	6,517	9,680
736.75	6,567	10,007
736.80	6,618	10,337
736.85	6,669	10,669
736.90	6,720	11,004
736.95	6,771	11,341
737.00	6,822	11,681
737.05	6,873	12,023
737.10	6,923	12,368
737.15	6,974	12,715
737.20	7,025	13,065
737.25	7,077	13,418
737.30	7,128	13,773
737.35	7,180	14,131
737.40	7,231	14,491
737.45	7,283	14,854
737.50	7,336	15,219
737.55	7,388	15,588
737.60	7,441	15,958
737.65	7,493	16,332
737.70	7,546	16,708
737.75	7,600	17,086
737.80	7,653	17,468
737.85	7,706	17,852
737.90	7,760	18,238
737.95	7,814	18,628
738.00	7,868	19,020
738.05	7,921	19,414
738.10	7,975	19,812
738.15	8,029	20,212
738.20	8,083	20,615
738.25	8,137	21,020
738.30	8,191	21,428
738.35	8,246	21,839
738.40	8,301	22,253
738.45	8,355	22,669
738.50	8,410	23,088
738.55	8,466	23,510
738.60	8,521	23,935
738.65	8,577	24,362
738.70	8,633	24,793
738.75	8,688	25,226
738.80	8,745	25,662
738.85	8,801	26,100
738.90	8,857	26,542
738.95	8,914	26,986
739.00	**8,971**	**27,433**

B-3 WQV - VOLUME ELEVATION

TSB-3 - WET VOLUME ELEVATION

TSB-3 - DRY VOLUME ELEVATION